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UNILATERAL RUPTURE OF CERVICAL DISC

GUY L. ODOM, M.D.

and

FREDERIC V. KRISTOFF, M.D.

DURHAM

Unilateral rupture of a cervical disc is analogous in many respects to rupture of an intervertebral disc in the lumbar region. It has been found to be the cause of a number of unexplained cases of pain in the upper extremity, which were previously referred to as cervical arthritis or neuritis, just as the lumbar protrusions have explained many cases of sciatica. In both locations there is pressure on a spinal nerve root, which in one case produces pain in the lower extremity, and in the other instance produces pain in the upper extremity. Both conditions produce the same type of mechanical and neurologic changes, except in cases where there is a massive protrusion. Because of the difference in the anatomy of the spinal canal in the two regions, a massive or medial protrusion in the cervical region involves the spinal cord, whereas in the lumbar region the cauda equina is affected.

Until recent years the occasional reports of ruptured cervical disc which appeared in the literature were all cases of cord compression. In 1943, Semmes and Murphey[1] reported 4 cases of compression of the seventh cervical root by a laterally ruptured disc between the sixth and seventh cervical vertebrae. Since then other reports have appeared[2]. In each series the symptoms and signs have been very similar, and a definite syndrome has been established which is as classical as the one due to a ruptured disc in the lumbar region. It consists of stiffness of the neck, pain radiating into the scapula or pectoral region and down the lateral aspect of the arm and forearm, with paresthesia or pain in the thumb, index finger, or middle finger. The pain is aggravated by movement of the neck or factors which increase intraspinal pressure. There may be motor weakness, sensory impairment and reflex changes in the involved extremity.

Location

Rupture of a cervical disc occurs most frequently at the fifth and sixth cervical interspaces, which are the ones subjected to the greatest degree of stress or movement. In our series of 26 cases[3] (table 1) there were 21 protrusions at the sixth interspace, 4 at the fifth, and 1 at the seventh. In the cervical region the nerve roots make their exit

From the Neurological Division of the Department of Surgery, Duke University School of Medicine, Durham, North Carolina.

Read before the Section on Neurology and Psychiatry, Medical Society of the State of North Carolina, Virginia Beach, Virginia, May 14, 1948.

1. Semmes, R. E. and Murphey, F.: The Syndrome of Unilateral Rupture of the Sixth Cervical Intervertebral Disc, with Compression of the Seventh Cervical Nerve Root, J.A.M.A. 121:1209-1214 (April 10) 1948.

2. (a) Spurling, R. G. and Scoville, W. B.: Lateral Rupture of the Cervical Intervertebral Discs, Common Cause of Shoulder and Arm Pain, Surg. Gynec. & Obst. 78: 350-358 (April) 1944.
   (b) Michelsen, J. J. and Mixter, W. J.: Pain and Disability of Shoulder and Arm Due to Herniation of the Nucleus Pulposus of Cervical Intervertebral Disks, New England J. Med. 231:279-287 (Aug. 24) 1944.
   (c) Bucy, P. C. and Chenault, H.: Compression of Seventh Cervical Nerve Root by Herniation of Intervertebral Disks, J.A.M.A. 126:26-27 (Sept.) 1944.
   (d) McKenzie, K. G. and Botterell, E. H.: The Common Neurological Syndromes Produced by Pressure from Extrusion of Intervertebral Disc, Canad. M. A. J. 46:424-435 (May) 1942.
   (e) Elliott, F. A. and Kremer, M.: Brachial Pain from Herniation of Cervical Intervertebral Disc, Lancet 1: 4-8 (Jan. 6) 1945.
   (f) Kristoff, F. V. and Odom, G. L.: Ruptured Intervertebral Disc in the Cervical Region; Report of 20 Cases, Arch. Surg. 54:287-304 (March) 1947.

3. (a) In none of these cases were there signs of cord compression.
   (b) Since this paper was presented, 10 additional cases have been operated on in the Duke Hospital.

Table 1

Case	*Age*	*Sex*	*Duration of Symptoms*	*Location of Disc*	*Hypesthesia (Fingers)*	*Muscle Weakness*	*Reflex Changes*	*Total Spinal Fluid Proteins (Mg. per 100 cc.)*	*X-Ray Changes*
1.	32	F	2 years	C-5—R	2nd and 3rd	Triceps	Biceps and triceps diminished	32	Narrowing and spur
2.	47	M	8 years	C-6—R		Triceps	Triceps diminished		Narrowing and spur
3.	35	F	3 years	C-5—L		Biceps, triceps, deltoid	Biceps diminished		Narrowing and spur
4.	48	F	6 weeks	C-6—L	2nd and 3rd	Triceps	Biceps diminished		None
5.	51	M	6 years	C-6—R	1st and 2nd	None	None		Narrowing, 5th and 6th interspaces
6.	39	M	1 year	C-6—L		Triceps, deltoid	None		None
7.	48	F	1 month	C-5—R	1st, 2nd 3rd, 4th	Diffuse	Triceps diminished		Narrowing, 6th interspace
8.	48	M	5 weeks	C-6—R		Deltoid, triceps			Narrowing of 5th and 6th interspaces, spur. Reversed curvature of cervical spine. Arthritic changes of 5th and 6th interspaces
9.	47	M	1½ years	C-6—L	2nd, 3rd, 4th	None			Narrowing, 5th and 6th interspaces, spur
10.	52	M		C-5—R	3rd	Deltoid, triceps	Triceps diminished		Reversed curvature of cervical spine
11.	52	M		C-6—R		Biceps, triceps	Triceps diminished		None
12.	56	M	9 weeks	C-6—R	1st, 2nd	Triceps, biceps, deltoid	Triceps diminished		Narrowing, 6th interspace
13.	34	M	3 months	C-5—R		Biceps	Biceps diminished		Reversed curvature of cervical spine
14.		M		C-6—R					
15.	44	F	3 months	C-6—L	2nd, 3rd, 4th	Triceps	Triceps diminished	41	Narrowing, 6th interspace
16.	45	M	2½ months	C-6—L	All fingers	Diffuse	None		None
17.	44	F	3½ weeks	C-6—L	2nd, 3rd	Triceps	None	48	Reversed curvature of cervical spine
18.	38	F	5 weeks	C-6—R	2nd, 3rd	Deltoid, triceps	Biceps and triceps diminished	33	Slight spur, 6th cervical vertebra
19.	48	M	3 weeks	C-6—L	2nd, 3rd	Deltoid, triceps	Triceps diminished		Narrowing, 5th interspace
20.	36	M	11 weeks	C-6—L	2nd, 3rd, 4th	Triceps		58	Narrowing, 6th interspace, spur
21.	39	M	3 months	C-6—L	2nd	Deltoid, triceps, biceps		84	None
22.	60	F	7 weeks	C-7—R	4th, 5th	Triceps			Narrowing, 7th interspace, spur
23.	59	F	1 year	C-6—R	1st, 2nd, 3rd	Deltoid, triceps			Narrowing, 6th and 7th interspaces
24.	39	M	6 weeks	C-6—R					Narrowing, 6th interspace
25.	51	M	2 weeks	C-6—L	1st, 2nd	Diffuse, triceps most marked	Biceps diminished		Spur
26.	54	F	8 months	C-6—R	2nd, 3rd, 4th	Deltoid, biceps triceps	Triceps diminished		None

from the spinal canal *above* their corresponding vertebrae; therefore, if there is a protrusion between the sixth and seventh cervical vertebrae, the seventh cervical nerve root is the one which will be compressed. Thus it can be seen that the cervical roots most commonly involved are the sixth and seventh. These points are mentioned because it is occasionally possible to localize the lesion by the distribution of pain and the specific findings on examination.

History and Symptoms

Although a history of trauma may be obtained, the majority of patients cannot recall receiving an injury. The first symptoms are stiffness and pain in the neck (wry neck), which may come on suddenly and occur in bouts. Later the pain radiates beneath the scapula or into the side of the chest, and then over the shoulder and down into the arm or forearm and at times into the hand and fingers. The pain frequently stops just above the wrist, and paresthesias may be felt in the thumb or fingers. Since the pain is aggravated by movement of the neck, the head and neck are usually held in one position (fig. 1). The pain is also made worse by conditions which increase intraspinal pressure, but not as frequently or to the same extent as in rupture of a lumbar disc.

Pressure on the root of the sixth cervical nerve produces pain or paresthesia in the thumb and occasionally in the thumb and second finger, whereas pressure on the seventh cervical root affects the second and third fingers, and occasionally the thumb.

Neurologic Signs

The areas of *impaired sensation* (as demonstrated by pinprick) may vary from a small triangle over the dorsum of the hand between the first and second metacarpal bones to a fairly wide band extending along the lateral aspect of the arm and forearm, to the lateral aspect of the dorsum of the hand, and into the thumb, index, and middle fingers (fig. 2). Eighteen of our 26 patients had definite sensory changes. In patients with involvement of the seventh cervical nerve root, the sensory changes always affected the index finger, with equal involvement of the thumb and third finger. In the 2 patients with involvement of the sixth root who had

Fig. 1. The head is held towards the side of the lesion. This patient had a ruptured disc between the sixth and seventh cervical vertebrae.

sensory changes, the thumb and second finger were both affected (fig. 3).

Motor weakness, if present, most frequently affects the biceps or triceps. Weakness of the biceps indicates involvement of the sixth cervical root, and weakness of the triceps, involvement of the seventh cervical root. Rupture of a disc at either the fifth or sixth cervical interspace may also decrease the motor strength of the deltoid muscle. Occasionally compression of a single root may produce diffuse motor weakness of the arm. If compression of the seventh cervical root involves more than one muscle, the triceps will be the most seriously affected. In our series of 26 cases, motor weakness of one or more muscles was elicited in 22.

When *reflex changes* are present, they are also helpful in localizing the protrusion.

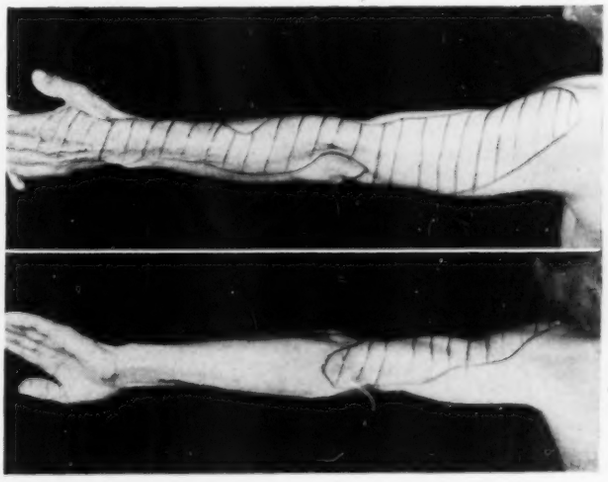


Fig. 2. The area of hypesthesia due to compression of the seventh cervical root by a ruptured disc between the sixth and seventh cervical vertebrae. The second and third fingers are also involved in most cases.

Fig. 3. The area of hypesthesia due to compression of the sixth cervical root by a ruptured disc between the fifth and sixth cervical vertebrae.

Suppression or absence of the biceps reflex indicates involvement of the sixth cervical nerve root, and decrease or absence of the triceps reflex, involvement of the seventh cervical root.

In cases of ruptured cervical disc, pressure on the spinous process of one of the lower cervical vertebrae will almost always reproduce the arm pain. Hyperextension of the neck may also aggravate the pain. Another test which often elicits the pain is flexing the neck towards the side of the lesion and exerting downward pressure on the top of the head. If these three maneuvers are positive, the diagnosis of a ruptured cervical disc is almost certain. They are extremely helpful in ruling out such lesions as the scalenus anticus syndrome and cervical ribs.

X-Ray Findings

X-rays of the cervical spine should be taken in antero-posterior, lateral, and oblique positions. These may reveal certain findings that are indicative of a ruptured disc, although not diagnostic. These changes are loss of the normal curvature, narrowing of the involved interspace, and spur forma-

Fig. 4. An x-ray of the cervical spine showing loss of normal curvature, narrowing between the fifth and sixth cervical vertebrae, and slight spur formation.

Fig. 5. An oblique view of the cervical spine, showing a bony spur projecting into the intervertebral foramen between the sixth and seventh cervical vertebrae.

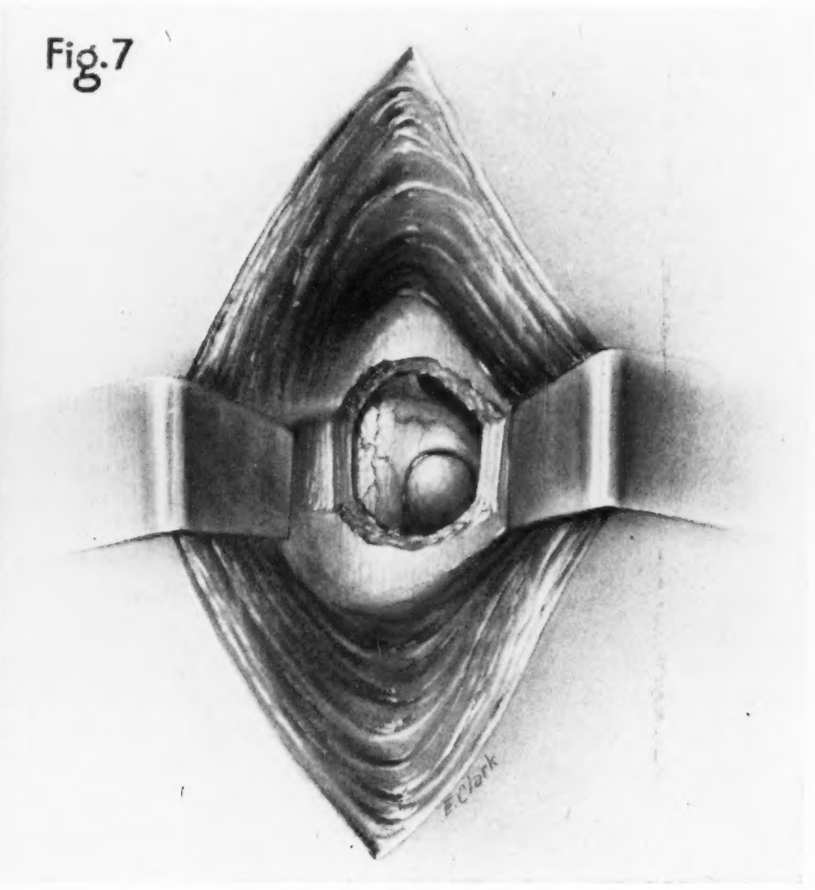


Fig. 6. A Pantopaque study showing defect between the sixth and seventh cervical vertebrae on the left due to lateral protrusion of the disc.

Fig. 7. Appearance at operation of a lateral ruptured cervical disc and nerve root.

tion from the edge of the vertebra at the involved disc (fig. 4). At times the oblique views will reveal a small osteophyte projecting into the intervertebral foramen (fig. 5). A Pantopaque examination is extremely helpful in the diagnosis and localization of the protrusion. This procedure should be carried out with 6 cc. of the oil. Care must be taken to keep the head and neck hyperextended to prevent the oil from running into the cranial cavity while it is being pooled in the cervical region. Because the disc protrudes far laterally, only a very small defect may be seen, such as non-filling of the nerve root (fig. 6). We feel that this procedure should always be carried out if there is any doubt about the diagnosis.

Treatment

All patients with unilateral ruptured cervical discs should be given a trial on conservative therapy. This should include bedrest, diathermy, and halter traction. If the patient fails to obtain relief from halter traction, or if the pain returns when activities are increased, then the protruded disc should be removed. This operation is done through a partial unilateral hemilaminectomy of the adjacent lamina, at the site of the protrusion (fig. 7). The operative results have been excellent in our series, and in almost every case there is immediate relief of the pain.

Discussion

Dr. Robert Graves (Durham): Dr. Odom has given us an extremely clear and precise description of this syndrome. The majority of cases of pain in an upper extremity are due to simple fibrositis or bursitis, and these patients usually get well with a heating pad or some simple home remedy. Other cases in which the pain persists, however, fall into a group presenting more diagnostic difficulties. One condition to be considered in such cases is certainly unilateral rupture of a cervical disc.

I think that the syndrome perhaps most difficult to differentiate from a ruptured cervical disc is what we call sometimes a cervical brachial myelitis, neuritis, or medullitis. The most important point in the differential diagnosis of this condition is the fact that it usually involves two or more secondary cords of the brachial plexus, rather than one or two primary cords.

To give you one illustration, a patient came in with a story of sudden pain in his neck and shoulder, radiating down his arm. Within the next week, he

developed weakness of the trapezius, the latissimus dorsi and the triceps. These muscles are supplied by the third, fourth, fifth, and sixth cervical motor roots; it would be almost impossible to get that picture with a ruptured cervical disc. It is my opinion that when more than two cervical roots—either sensory or motor—are involved, the chances are that we are dealing with what we usually call brachial neuritis, and not with a herniated cervical disc.

THE THORACOLUMBAR SYNDROME AS A COMMON CAUSE OF BACKACHE

J. E. JACOBS, M.D.

CHARLOTTE

Although articles on the differential diagnosis and treatment of low back pain rarely include the thoracolumbar syndrome among the possible causes, it is my belief that irritation of the thoracolumbar region, with its associated neuralgia, is a common basis for low backache. The rather high incidence (10 to 15 per cent) of this syndrome in our cases of low back pain makes me feel that this problem should be more thoroughly understood and widely discussed. I have found it to be the responsible factor in several female patients who, after the usual conservative orthopedic care, pelvic surgery, appendectomy, and urologic investigation, continued to complain of back and "hip" ache. In the army I was astounded at the frequency of this syndrome, both on our orthopedic service and in soldiers whom I saw in consultation on urologic and general surgical services.

The literature on this syndrome is not profuse, and the subject is seldom mentioned in medical school lectures. One of the early references to the subject is found in an article by Carnett on "Intercostal Neuralgia"[1]. In his article, "The Viscerospinal Syndrome,"[2] Ussher discusses the subject from the standpoint of the internist. This article offers much food for thought. The recent book on "Segmental Neuralgia in Painful Syndromes" by Judovich and Bates[3] is excellent.

Read before the Section on Surgery, Medical Society of the State of North Carolina, Virginia Beach, Virginia, May 14, 1947.

1. Carnett, J. B.: Intercostal Neuralgia as a Cause of Abdominal Pain Tenderness, Surg., Gynec. & Obst. 42:625-632 (May) 1926.
2. Ussher, N. T.: The Viscerospinal Syndrome, Ann. Int. Med. 13:2057-2090 (May) 1940.
3. Judovich, B. D. and Bates, W.: Segmental Neuralgia in Painful Syndromes, ed. 2, Philadelphia, F. A. Davis Co., 1946.

Anatomy of the Thoracolumbar Region

Bones

Study of the bony structure of this region discloses a significant fact[4]. The thoracolumbar articulation occurs in the sagittal plane, whereas the articulation between the eleventh and twelfth thoracic vertebrae is in the coronal plane. The twelfth thoracic vertebra can thus be identified by its asymmetrical facets—the superior articular processes facing forward, the inferior laterad. In the lumbosacral area the mechanical asymmetry has been stressed as an etiologic factor in low backache. Such articulations mechanically are not sound, and inasmuch as the superior articulation is protected by the more or less fixed rib cage, the inferior articulation (the thoracolumbar junction) receives the greatest strain.

The intervertebral foramen and the intervertebral disc are not of the same importance in the production of pain in this area as they are at the lumbosacral area, although the intervertebral foramen for the twelfth thoracic nerve is smaller than any of its contiguous ones[5]. I have been unable to demonstrate by myelogram any evidence of a ruptured intervertebral disc in cases of thoracolumbar syndrome.

The twelfth rib articulates with the vertebral body by a single facet and has no articulation on the transverse process. Goldthwait[6] stressed the point that the twelfth rib has no interarticular ligaments and is capable of movement in all directions, so that when the other ribs are elevated it is depressed by action of the diaphragm. This depression has been shown to give rise to a neuralgia involving the twelfth thoracic nerve.

The normal contour of the spine is such that the twelfth thoracic vertebra lies at the junction of the thoracic kyphosis and the lumbar lordosis. Any scoliosis almost invariably involves this area. Such a leverage area, where the fixed dorsal spine joins the more movable lumbar spine, must be subjected to unusual strain, as is evidenced by the high incidence of compression fractures of the twelfth thoracic vertebra[7]. The lumbar en-

4. Gray, H.: Anatomy of the Human Body, edited by W. H. Lewis, ed. 22, Philadelphia, Lea and Febiger, 1930, p. 99.
5. Gray(4), p. 111.
6. Goldthwait, J. E.: The Rib Joints, New England J. Med. 223:568-573 (Oct. 10) 1940.
7. Watson-Jones, R.: Fractures and Joint Injuries, ed. 3, Edinburgh, E. S. Livingstone, 1943, v. 1, p. 301.

largement of the cord at the thoracolumbar area makes the housing relatively smaller here. The fact that the transverse processes are shorter in the upper lumbar area means that less protection is afforded the spine in this area. The muscle masses attached to the ilium and femur below and to the rib cage and thoracic vertebrae above therefore give a powerful leverage action at the thoracolumbar area.

Ligaments and fascia

The ligaments at the thoracolumbar junction do not offer the protection that the massive ones at the lumbosacral joint do. The lumbodorsal fascia is an investing membrane which covers the deep muscles of the back[8]. It is frequently affected by fibrositis.

Nerves

The twelfth thoracic nerve is attached to the spinal cord by two roots—anterior and posterior. The latter is characterized by the presence of a spinal ganglion. The twelfth thoracic nerve comes off the cord at about the level of the tenth thoracic vertebra, so that an intraspinal lesion affecting it must be sought at a distance of at least two vertebrae above. The sympathetic trunk supplies a branch (gray ramus communicans) from its ganglion to the twelfth thoracic nerve, and in turn receives a branch (white ramus communicans) from this same nerve.

The spinal nerves split into a posterior division and an anterior division. The former supply muscles and skin of the posterior trunk. In the case of the twelfth thoracic nerve, the medial branch of the posterior division descends along the spinous processes of the lumbar vertebrae, occasionally supplying the skin in the midline in the region of the fourth and fifth lumbar spinous processes. The lateral branch of the posterior division, after sending a filament mediad along the crest of the ilium, passes downward through the skin of the buttocks[9].

The anterior division of the twelfth thoracic nerve supplies the anterolateral part of the lower trunk—a fact which readily explains reference of pain to the lower abdomen. The lateral cutaneous branch of the anterior division enters the skin just about an inch above the middle of the crest of the ilium. It does not divide into anterior and posterior branches, but is distributed through the skin of the front part of the gluteal region as far down as the greater trochanter[10]. This distribution over the hip may produce pain which is often called "sciatica" by casual observers. The medial cutaneous branch of the anterior division gives off a communicating branch to the first lumbar nerve (iliohypogastric nerve) and supplies the skin over the anterior-inferior iliac region, the groin, and the suprapubic region[11]. This communicating branch from the twelfth thoracic nerve to the lumbar plexus[12] readily explains the overflow of pain into the iliohypogastric and the ilio-inguinal regions often seen clinically (fig. 1).

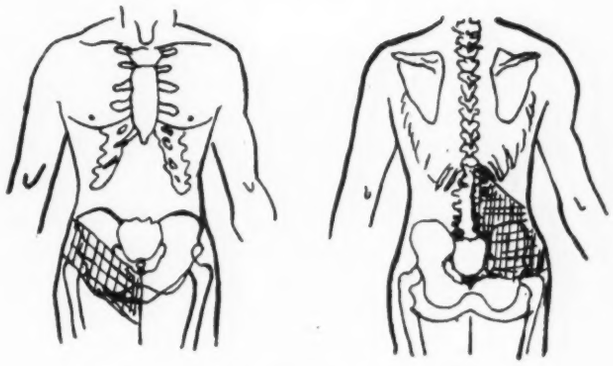


Fig. 1. Twelfth thoracic and first lumbar hyperalgesia.

Blood vessels

Since no arthritis or structural changes could be demonstrated in some cases of chronic neuralgia, the subject of vascular pain[13] was considered. The arterial supply of the spinal ganglion is vulnerable, and reduction in the number of posterior root fibers after the third decade, with mild degeneration of the posterior column, has been shown by Bergmann and Alexander[14]. Only one fourth of the nerve roots in man have segmental arteries which contribute to the circulation of the spinal cord, and the lower thoracic region has the poorest blood supply of the entire cord. This factor may play a part in the frequency of neuralgia in this region, although I have not found that either vasoconstrictor or vasodilator drugs have any effect in these cases.

8. Gray(4), p. 894.
9. Gray(4), p. 919, fig. 809 and 810.
10. Gray(4), p. 942, fig. 827.
11. Gray(4), p. 943, fig. 828.
12. Gray(4), p. 946, fig. 830.
13. Yaskin, J. C.: Disease of Peripheral Nerves, in The Cyclopedia of Medicine, ed. 13, Philadelphia, F. A. Davis Co., 1935, v. 9, p. 73.
14. Bergmann, L. and Alexander, L.: Vascular Supply of the Spinal Ganglia, Arch. Neurol. & Psychiat. 46:761-782 (Nov.) 1941.

Etiology

As Carnett[1] and Goldthwait[6] pointed out, the most common cause of neuralgia involving the twelfth thoracic nerve is some spinal abnormality causing inflammation about the spinal nerve root, or actual pressure on it. Among the conditions which may produce such an abnormality are lordosis, scoliosis, and occasionally arthritis. The occurrence of the thoracolumbar syndrome following an acute infection of the upper respiratory tract is not uncommon. In such cases associated foci of infection in the teeth, nose and throat, or prostate should be eliminated as possible causes. The history of an acute sprain of the back in the thoracolumbar area, preceding the development of pain radiating into the hip and groin, is commonly obtained in industrial medicine. The part which may be played by fibrositis, with or without associated nodules, has been stressed by Menell[15].

Diagnosis

History

The diagnosis of the thoracolumbar syndrome is not difficult. It must be considered as a possibility in any patient with chronic, dull, aching pains in the low back, radiating over the crest of the ilium and sometimes producing dull, chronic abdominal discomfort.

The intensity and duration of pain may vary almost unbelievably. It may be a mild soreness or an excrutiating pain, and may last for a few hours or for years. This condition may be found in the apparently normal child whose play is interrupted with a "stitch" in the side which disappears upon resting; in the patient with "chronic appendicitis," whose pain recurs postoperatively; and in the ptotic, dyspeptic neurotic with operative scars and a symptom complex which may be traced back, through exacerbations and remissions, to youth. The persistent mild soreness may become the excrutiating stabbing pain of toxic neuralgia, similar in severity to that of sciatica or tic douloureux, and even simulating an intra-abdominal catastrophe[16]. The pain may involve the eleventh or twelfth thoracic segment, or the first lumbar distribution, unilaterally or bilaterally.

15. Mennell, J.: Backache, Philadelphia, P. Blakiston's Sons and Co., 1931.
16. Carnett, J. B.: A Case of Intercostal Neuralgia Simulating an Acute Intra-Abdominal Catastrophe, S. Clin. North America 10:1329-1334 (Dec.) 1930.

Physical examination

Since pain is a subjective symptom, one must look for other signs such as tenderness elicited by palpation. Tenderness on deep palpation over the costovertebral area, extending out over the crest of the ilium and trochanter, is a rather constant finding. The examination of the involved thoracolumbar region should be compared with that of the opposite side; when a bilateral lesion is suspected, comparison with remote regions may be necessary.

Stroking the skin with a pin point is a useful test. Hyperesthesia may be elicited over the trunk of the involved nerve, along its course between or below the ribs, along its terminal distribution on the lower abdominal wall, and over its extensions into the groin and inside portion of the upper thigh (fig. 1). The dermatome area of hyperesthesia corresponding to figure 1 may be most noticeable posteriorly, laterally, or anteriorly, but remains constant during an acute episode. Stroking with a pin may excite the pilomotor elements of the skin in the involved dermatome, so that a cutis anserina or "goose flesh" is observed even before the patient flinches or reports a burning sensation.

Limitation of motion in the spinal segment, from the ninth thoracic down to the second lumbar area in one or all planes, is invariably noted. Aggravation of the discomfort by bending, coughing, or sneezing is a common observation. The presence of even a mild degree of scoliosis lends further weight to the diagnosis of the thoracolumbar syndrome[17].

X-ray findings

X-rays taken with the patient lying down are often negative, but if they are taken according to the technique described by Hudson[18], with the patient standing, the depressed twelfth rib, the lumbar scoliosis, the pelvic tilt, and the internal rotation of the head of the femur on the side of the low crest of ilium can be observed.

Differential diagnosis

Because of the costovertebral tenderness and the reference of pain into the inguinal or suprapubic regions, many patients with the thoracolumbar syndrome are seen first

17. Slobe, F. W.: The Dorso-lumbar Syndrome with Special Reference to Referred Pain, Illinois M. J. 80:332-336 (Oct.) 1941.
18. Hudson, O. C., Hettesheimer, C. A., and Robin, P. A.: Causalgic Backache, Am. J. Surg. 52:297-303 (May) 1941.

by the urologist. Pain referred into the lower chest and lower abdomen may send the patient to a general surgeon, and a cholecystectomy or appendectomy may be performed, without relief. Several patients who experienced severe pain in the inguinal region at the time of the acute thoracolumbar strain thought that they had "ruptured" themselves.

Female patients with this condition who have pain referred to the suprapubic area and lower pelvis may consult a gynecologist. The genito-femoral distribution of hyperesthesia has been the cause of dyspareunia in several of our cases, although I have never seen this recorded as an etiologic factor in the books on gynecology.

One patient who was referred to us had previously been sent to a neurosurgeon for chordotomy because of excrutiating radicular pain along the course of the twelfth thoracic nerve on the right. This patient had had numerous cystoscopic examinations, a cholecystectomy, an appendectomy, a uterine suspension, and an ovarian cyst removed—all without relief. After we balanced her pelvis with a half-inch elevation of the left heel, gave her two perineural injections, and provided an adequate back support, she returned to work in a mill.

Treatment

The most important part of the treatment is to correct any postural defects present. Elevation of one heel is often necessary to correct a scoliosis[2,18]. Heat applied to the thoracolumbar area, rather than the lumbosacral area, may be helpful, although we have noticed that during the stage of acute hyperesthesia heat may be aggravating and a support may not be tolerated. After this stage is passed, the use of a corset with stays which go up beyond the thoracolumbar area, a brace which will protect this area, or even a plaster-of-paris jacket, if indicated later, may be prescribed. Rest on a firm mattress and graded exercises stressing good posture are advisable. The removal of obvious foci of infection and dietetic measures to improve the patient's nutrition will hasten his recovery.

During the acute phase a paravertebral nerve block will often give remarkable relief. The technique for injection of the twelfth thoracic and first lumbar nerves is as follows:

The patient lies in the prone position with a pillow under the lower abdomen. This flexes the spine, brings the last rib into prominence, and widens the spinous interspaces. The spinous processes of the first and second lumbar vertebrae are located; at a point overlying the upper edge of the first spinous process a line is drawn, on the side involved, at right angles to the long axis of the spine. Three centimeters laterally on this line a wheal is raised with procaine. Another wheal is raised on a similar line extending over the upper edge of the second lumbar spinous process at a distance 3.5 cm. from the midline. This distance also applies to the rest of the lumbar vertebrae, in case a more extensive nerve block is desired.

A 3-inch, 21-gauge needle is passed directly downward through each wheal to the transverse process. If the landmarks are correct, the needle point should impinge on the transverse process of the vertebra at a depth of about 4 to 6 cm. Should the needle point not touch the transverse process, it should be partially withdrawn and reinserted caudad or cephalad until the transverse process is located. After the depth of the transverse process is determined, the needle is partially withdrawn and reinserted, gradually changing the angle until the needle just clears the transverse process. It is then inserted to a depth 2 cm. beyond the transverse process. The needle should not be directed toward the spine. The plunger of the syringe is withdrawn to make sure that the needle point is not in a blood vessel. Five cubic centimeters of a 2 per cent solution of Novocain with Sarapin[3] is then injected at each trunk.

In order to inject the twelfth dorsal nerve, it is necessary to locate the transverse process of the first lumbar vertebra. The first lumbar nerve is injected by locating the transverse process of the second lumbar vertebra.

Summary

The high incidence of the thoracolumbar syndrome in patients with low back pain is seldom recognized in the literature. The thoracolumbar spine, because of certain mechanical and anatomic factors, is susceptible to frequent strain and irritation. Irritation of the twelfth thoracic and first lumbar segments may produce symptoms simulating sacro-iliac and lumbosacral pain, or any of

several urologic, gynecologic, or surgical problems. The thoracolumbar syndrome produces consistent objective findings which will aid the investigator in ruling out other conditions.

The most effective method of therapy in cases of the thoracolumbar syndrome is perineural injection associated with the correction of obvious postural defects.

Discussion

Dr. H. H. Hodges (Charlotte): I feel sure that many of us have seen patients with the symptoms described by Dr. Jacobs and have vaguely ascribed them to intercostal neuralgia, radicular pain, or other similar conditions. With the description of symptoms, anatomy, and etiology which Dr. Jacobs has given us, we should be better able to recognize and treat such cases properly.

As Dr. Jacobs pointed out, far too many patients have been subjected to a needless series of abdominal operations for relief of pain which actually arises from the spinal or vertebral column. It well behooves the surgeon to think of this possibility before opening the abdomen.

On the other hand we must not forget that a wide variety of abdominal and some extra-abdominal diseases may present symptoms which might easily be confused with those described by Dr. Jacobs. Herpes zoster in its pre-eruptive stage might be difficult to differentiate from the acute phase of the thoracolumbar syndrome. I have seen recently a patient with a colonic neoplasm whose presenting symptom was pain radiating around the left lower rib margin from behind. This was initially thought to be nerve-root pain. Certain diseases of the liver such as tumor and hepatitis may produce pain in the right thoracolumbar area before jaundice is evident. Peptic ulcer of the posterior wall and gallbladder disease also produce pain in the back not infrequently. Renal stones and other renal lesions may produce pain in the back which radiates downward and anteriorly without being typical of colic. One might continue the list to include root pain produced by early cord tumors, the girdle pains of tabes dorsalis, pain caused by the vertebral erosion of an abdominal aneurysm, and retroperitoneal tumors.

The important thing is that all of the patient's symptoms must be carefully evaluated in relation to the whole. With careful examination and reflection, the proper diagnosis will be made in the majority of instances. The data which Dr Jacobs has presented should help us to differentiate cases of the thoracolumbar syndrome from the many other conditions which might cause similar pain.

The author wishes to thank the Heineman Foundation, Charlotte Memorial Hospital, for the slides used during this talk.

The existing relations between science and the public can still be summed up largely in the anecdote used by Lord Rayleigh . . . a decade ago. The great Australian transcontinental railway had been completed, and the first train was being dispatched at a gala ceremony. At the climactic moment, the passengers waved, the crowd cheered, the signal was given, and the locomotive proudly started off—leaving the train standing. Someone had forgotten to couple the engine to the cars.—R. W. Gerard: Science and the Public, Science 106:23 (July 11) 1947.

RADIOLOGIC DIAGNOSIS OF PATENT DUCTUS ARTERIOSUS

J. P. ROUSSEAU, M.D.
and
STUART W. GIBBS, M.D.
WINSTON-SALEM

Recent improvements in the technique of thoracic surgery, and the development of operations for the repair of certain cardiac anomalies have made the diagnosis of congenital malformations of the heart increasingly important. Although the surgical treatment of some of these anomalies offers only partial relief, the one with which we are concerned today—patent ductus arteriosus—can be completely overcome, in uncomplicated cases, by successful ligation or division. With this fact in mind, I would like to review briefly the chief roentgenologic features of this condition, and present the radiologic findings in an additional 6 cases which have been proven at surgery.

Perhaps the most important place in the diagnosis of patent ductus is assumed by the clinician, since the most constant finding is that of a "machinery murmur" in the pulmonic area. The radiologist plays a definite role in confirming the clinical picture and in determining the extent of the physiologic changes both before and after surgery. In a few cases the characteristic murmur and thrill are not present, and one must rely on the x-ray findings alone. A final diagnosis should never be made until the clinical and radiologic features have been carefully correlated. Kymography and angiocardiography[1] are reported to be of value in the diagnosis of patent ductus arteriosus, but have not been used by us.

The most comprehensive study of this subject is that published by Donovan, Neuhauser, and Sosman[2] in 1943, in which 50 proven cases were presented. We shall follow their plan for presentation of the x-ray findings. Further clinical and operative find-

From the Department of Radiology, Bowman Gray School of Medicine of Wake Forest College, and the North Carolina Baptist Hospital, Winston-Salem, North Carolina.

Read before the Section on Radiology, Medical Society of the State of North Carolina, Virginia Beach, Virginia, May 13, 1947.

1. Steinberg, M. F., Grishman, A., and Sussman, M. L.: Angiocardiography in Congenital Heart Disease: Patent Ductus Arteriosus, Am. J. Roentgenol. 50:306-315 (Sept.) 1943.
2. Donovan, M. S., Neuhauser, E. B. D., and Sosman, M. C.: Roentgen Signs of Patent Ductus Arteriosus, Am. J. Roentgenol. 50:293-305 (Sept.) 1943.

ings on this series of 6 cases have been reported elsewhere[3]. Associated congenital anomalies will not be considered in this discussion.

Preoperative Findings

In the literature

1. The most frequent finding recorded is *dilatation of the pulmonary artery,* which is present in about 80 per cent of the cases. Eppinger and Burwell[4] have clearly explained the physiologic basis for this finding and the others to be discussed. The dilated pulmonary artery results from the abnormally large volume of blood which flows into this vessel from both the right ventricle and the aorta.

2. The second most common finding, present in 76 per cent of the cases, is *cardiac enlargement,* with a predominance of left ventricular hypertrophy. In some cases as much as 75 per cent of the output of the left ventricle passes through the ductus to the pulmonary artery. Since the left ventricular output, in order to maintain an adequate systemic circulation, must be two to four times that of the right ventricle, hypertrophy of the cardiac musculature results. The enlargement is seldom marked unless complications are present.

3. *Enlargement of the left auricle* is present in about 70 per cent of the cases and is due to the fact that the mitral valve cannot transmit the greater volume of blood returning from the lesser circulation.

4. *Pulmonary congestion* is seen in about 70 per cent of the cases, and is due to the increased volume of blood in the lesser circulation.

5. *Exaggerated beat of both the left ventricle and the pulmonary artery* results from the increased volume of blood passing through these structures, and is present in approximately 70 per cent of the cases.

6. The most infrequent finding, but one which may be very striking when present, is that of *expansile pulsations of the pulmonary vessels.* This is seen in about a third of the patients and is due to the increased volume of blood present in the pulmonary arteries, with associated insufficiency of the pulmonary valve[5].

In our series

In our series of 6 cases (table 1) the ages of the patients ranged from 16 to 30 years, averaging 23½. There were 2 men and 4

3. Bradshaw, H. H., Molineux, W. L., Bowman, M. C.: Surgical Treatment of the Patent Ductus Arteriosus. Arch. Surg. 53:489-498 (Nov.) 1946.

4. Eppinger, E. C. and Burwell, C. S.: The Mechanical Effects of Patent Ductus Arteriosus on the Heart and Their Relation to X-Ray Signs. J.A.M.A. 115:1262-1264 (Oct. 12) 1940.

5. Roesler, H.: Clinical Roentgenology of the Cardiovascular System. Springfield, Illinois, Charles C. Thomas, 1937.

Table 1

Preoperative X-Ray Findings Recorded in Individual Patients

Case	1	2	3	4	5	6	Incidence
Sex	F	M	F	M	F	F	2 women to 1 man
Age (years)	24	25	18	28	30	16	Average 23.5
Cardiac enlargement	+	+++	+	0	+	++	84%
Left ventricular enlargement	+	+++	+	0	+	++	84%
Left auricular dilatation	0	+++	0	0	0	++	33%
Enlargement of pulmonary artery	+	+++	0	+	++	++	84%
Hyperactivity of left ventricle and pulmonary artery	+ or ++	NR*	0	NR*	NR*	0	?16%
Hilar dance of pulmonary vessels	+	NR*	0	+	+	0	50%
Engorgement of pulmonary vessels	+	+++	0	+	+	++	84%
Transverse diameter of heart	11.3	17.0	13.5		13.0	13.2	
Transverse diameter of chest	23.7	?	24.0		26.0	26.2	

Associated findings were subacute bacterial endocarditis in cases 1, 2, 4, and 5, and a saccular aneurysm of the pulmonary artery proximal to the ductus in case 3.

*Not recorded.

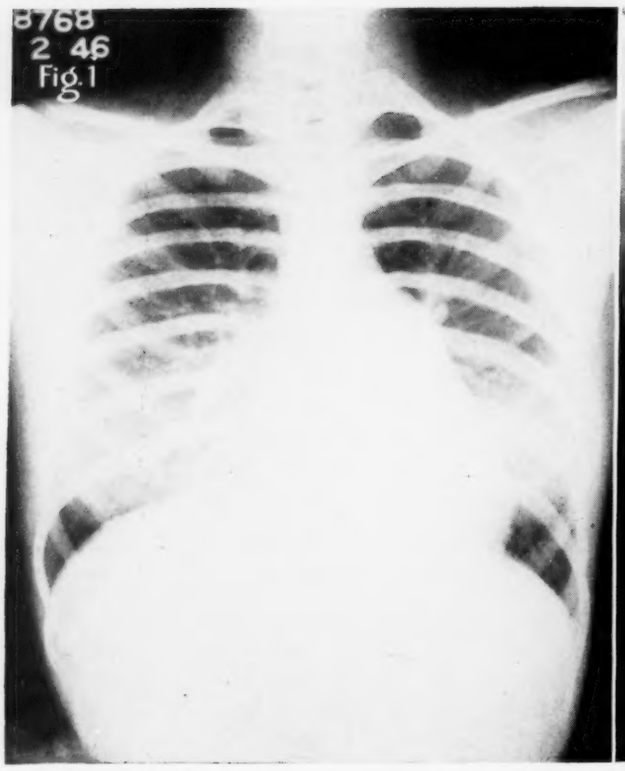


Fig. 1 (Case 6). A posterior anterior film of the chest shows cardiac enlargement in the transverse diameter, predominantly left ventricular. There is also a prominence in the region of the pulmonary artery, prominence of the pulmonary vascular markings, and a small aortic shadow. Fluoroscopic examination with a barium swallow showed enlargement of the left auricle and hyperactivity of the left ventricular beat. No "hilar dance" was noted.

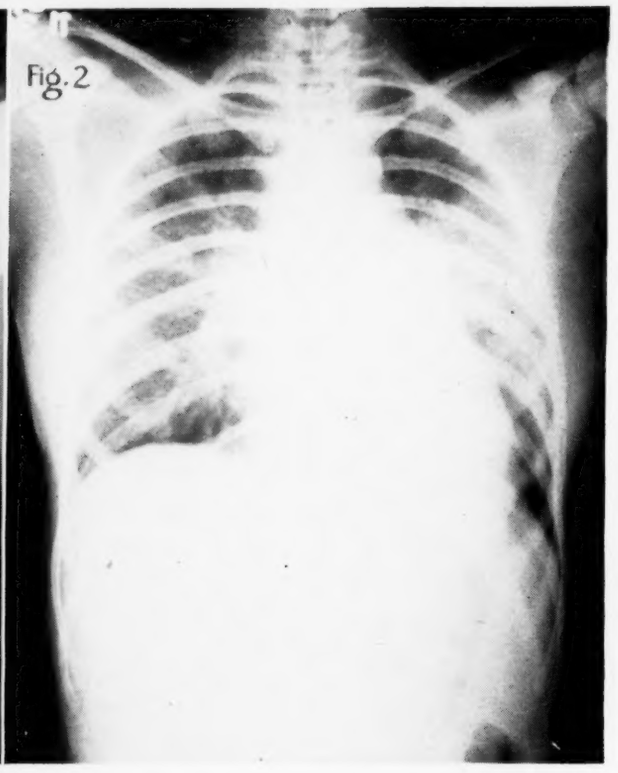


Fig. 2 (Case 6). A postoperative chest film shows a decrease in the pulmonary congestion. Other cardiovascular findings are essentially unchanged. The usual pleuropulmonary changes following surgery are present.

women. Four of the patients had subacute bacterial endocarditis which was treated medically before operation with sulfonamide drugs and penicillin. In one case a saccular aneurysm of the pulmonary artery was present proximal to the ductus. No other complications were encountered.

1. *Dilatation of the pulmonary artery* was present in all except one case. In 4 cases it was slight to moderate in degree, but one patient with bacterial endocarditis had rather marked enlargement of the pulmonary artery. The dilatation was visible on the posterior anterior view, but was better demonstrated in the right anterior oblique position, in which the pulmonary conus can be visualized. Other causes of fullness of the cardiac waistline and prominence of the pulmonic arch, such as mitral valvular disease, thyrotoxicosis, aneurysms of the pulmonary artery, pulmonic stenosis with poststenotic dilatation, and other types of congenital heart diseases, must be excluded.

2. *Cardiac enlargement* was present in all but one case. In 4 patients it was slight to moderate in degree, and was predominantly left ventricular. Only 1 patient had marked cardiac enlargement, and this case was complicated by innumerable vegetations of subacute bacterial endocarditis on the aortic valve. Other causes of cardiac enlargement must be ruled out. One patient (case 3) had cardiac enlargement with a configuration typical of an aortic valvular lesion, but we felt that treatment should be based on the clinical and physical findings, which were typical of patent ductus.

3. *Enlargement of the left auricle* was present in only 2 of our cases (no. 2 and 6), being marked in one patient with subacute bacterial endocarditis and moderate in a second. The incidence of this finding in our series is only half as great as that reported by the group in Boston. This finding may be demonstrated by barium swallow in the right anterior oblique position. It can usually be differentiated clinically from enlargement of the left auricle associated with rheumatic heart disease with mitral stenosis.

4. *Engorgement of the pulmonary vessels*

was marked in one of our patients, moderate in one, slight in three, and absent in one. The case with marked engorgement was complicated by bacterial endocarditis.

5. *Exaggerated beat of the left ventricle and the pulmonary artery* was recorded in only one of our cases (no. 1), being present to a moderate degree on one examination and to a slight degree at a later date. This finding was absent in 2 cases (no. 3 and 6), and unfortunately was not recorded as either present or absent in the remaining 3 cases. Other causes of hyperactivity may be thyrotoxicosis, anemia, and aortic insufficiency.

6. The *expansile pulsation or "hilar dance"* was present in 3 cases and absent in 3. This finding is not diagnostic, and may be present in other types of congenital heart disease. The most pronounced case of hilar dance we have encountered was associated with stenosis of the pulmonary artery with poststenotic dilatation.

Postoperative Findings

All of the above findings revert to normal, or nearly so, following closure of the ductus, except for hypertrophy of the left ventricle, which shows little change as a rule. The only postoperative films we have on our patients were made soon after operation and show little change. On films made at a later date the changes would probably have been more definite.

Summary

1. The radiologic findings in 6 cases of proven patent ductus arteriosus have been presented.

2. Each of the characteristic findings previously reported—dilatation of the pulmonary artery, cardiac enlargement, enlargement of the left auricle, engorgement of the pulmonary vessels, exaggerated beat of the left ventricle and pulmonary artery, and "hilar dance"—occurred in at least one case in our series.

3. The findings vary considerably in each patient, but the presence of one or more of these features should make one suspect the diagnosis.

4. Marked cardiac enlargement is present, as a rule, only when the condition is complicated by subacute bacterial endocarditis or associated anomalies.

5. A final diagnosis should be made only after close correlation of the radiologic and clinical findings.

X-RAY FINDINGS IN ARTIFICIAL PNEUMOTHORAX

ROBERT H. HACKLER, M.D.

WASHINGTON

Pneumothorax in Non-Tuberculous Pulmonary Lesions

The primary use of artificial pneumothorax is for the treatment of pulmonary tuberculosis. However, it has also been used, without much success, in treating non-tuberculous lesions of the lungs such as bronchiectasis and pulmonary abscess. Figure 1 shows a lung abscess situated near the periphery. It has a thick wall and pleural adhesions—the main causes for failure of collapse therapy. These adhesions usually form early in peripheral abscesses, preventing effective collapse. Figure 2 shows the results of pneumothorax. The large cavity has been diminished in size, but only the middle and lower lobes show any collapse, and two fluid levels are still plainly visible in the diseased area.

Pneumothorax as a Diagnostic Procedure

Artificial pneumothorax is also used as a diagnostic procedure to differentiate pleural and pulmonary lesions. In figure 3, 135A shows an opacity over the left half of the diaphragm and apparently in contact with the left border of the heart shadow; 135B is a film made after artificial pneumothorax. A points to the shadow of the cyst, B to the collapsed lung, and D to the overlying breast shadow. This film definitely demonstrates that the lesion was extrapulmonary. It was removed surgically and proved to be a pleuro-pericardial cyst filled with a clear fluid[1].

It is my opinion that this type of diagnostic procedure should be undertaken only in medical centers. Cases of artificial pneumothorax seen by physicians in smaller communities are practically always in patients with pulmonary tuberculosis.

Pneumothorax in Pulmonary Tuberculosis

Today the welfare of many thousands of people throughout the country is dependent

Read before the Section on Radiology, Medical Society of the State of North Carolina, Virginia Beach, Virginia, May 13, 1947.

1. Rigler, Leo G.: The Chest: A Handbook of Roentgen Diagnosis, Chicago, Year Book Publishers, Inc., 1946, p. 169.

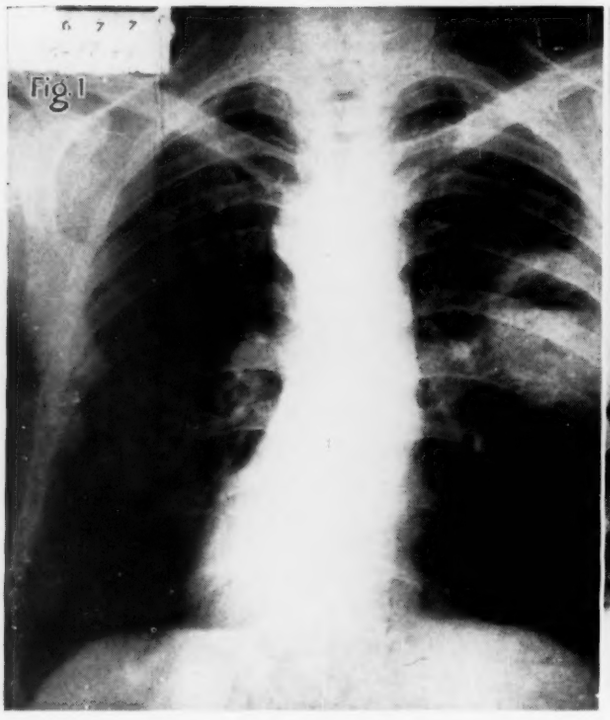


Fig. 1. Peripheral abscess before pneumothorax therapy (Courtesy of Dr. C. T. Garrenton.)

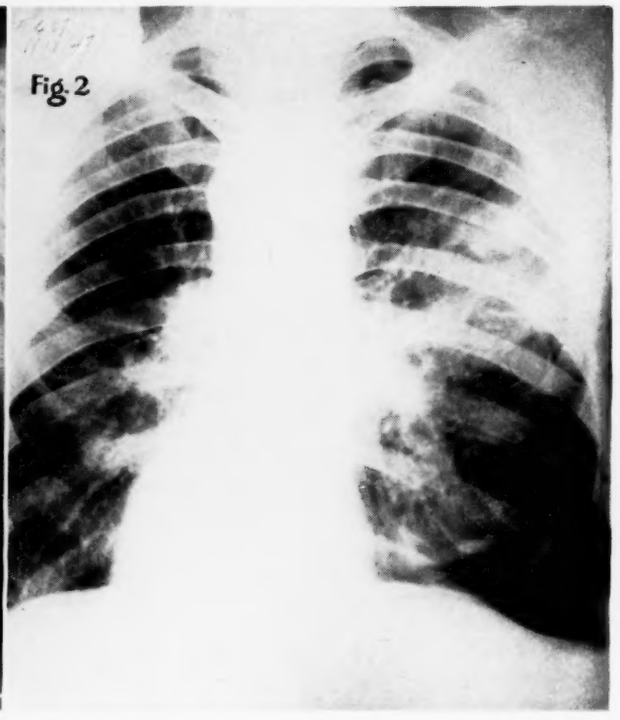


Fig. 2. The same patient after a few months of pneumothorax therapy (Courtesy of Dr. C. T. Garrenton.)

on artificial pneumothorax. Their hope for ultimate recovery and return to a useful life is based largely upon the correct handling of their case and the judicious continuation of the therapy. The radiologist thus has a heavy responsibility in these cases, and must make each examination with care. It is true that in the early months of treatment such patients are usually in a sanatorium and are cared for by the resident specialist. When they return to their homes, however, they must look to a local physician for continued therapy, and the radiologist will often have the major part of the responsibility for guiding their treatment.

Patients who have just been discharged from a sanatorium are often apprehensive about their future. They wonder whether or not the local physician will understand their case and how he will get along with pneumothorax refills. They want, and they should have, x-ray examinations at regular inter-

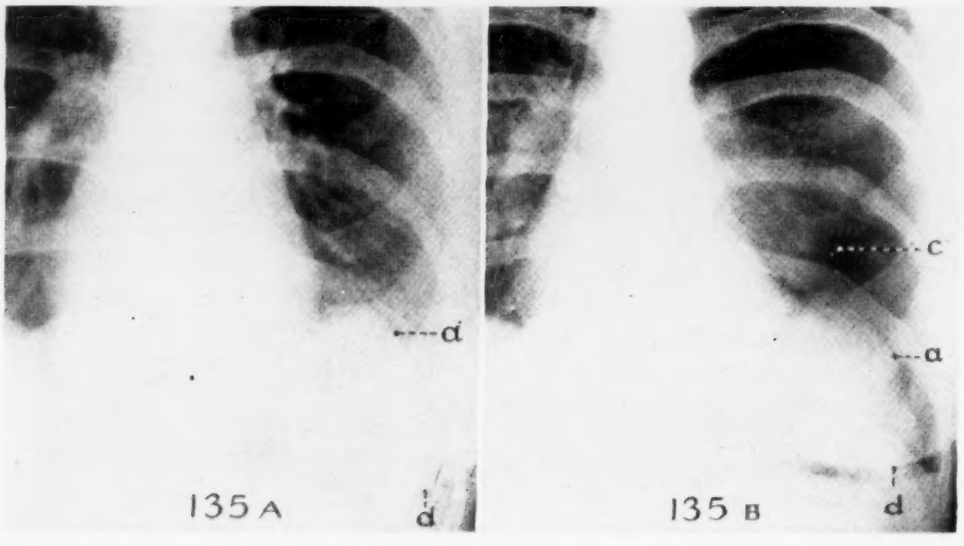


Fig. 3. X-ray before pneumothorax (135A) shows a mass overlying the left hemidiaphragm. X-ray following a diagnostic pneumothorax (135B) shows an extrapulmonary mass (a), the collapsed lung (c), and the breast shadow (d). (Courtesy of Dr. Leo Rigler[1])

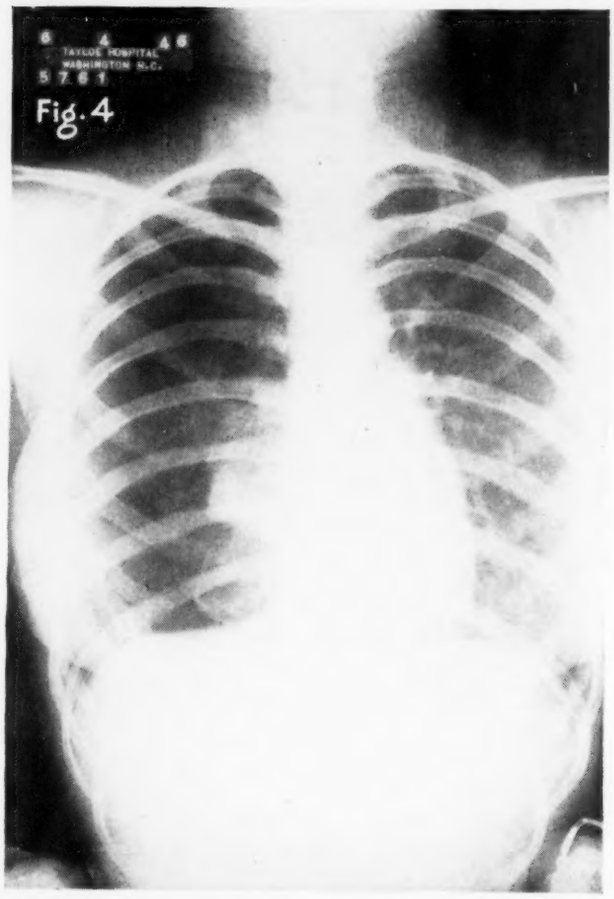


Fig. 4. Approximately a 60 per cent collapse in all the lobes on the right. No cavities or pleural adhesions are seen.

vals. The films are important for a permanent record, and they help the physician to advise the patient about his problems of rehabilitation. The physician is asked such questions as: "Am I able to drive a car?"; "Can I start light work?"; "Can I go longer between refills?"; "Can I take a trip?"; and often, "Can I get married?" It is easy to see that unsound advice could prove disastrous. Only by a thorough knowledge of the pathologic condition of the chest can the physician answer these questions wisely.

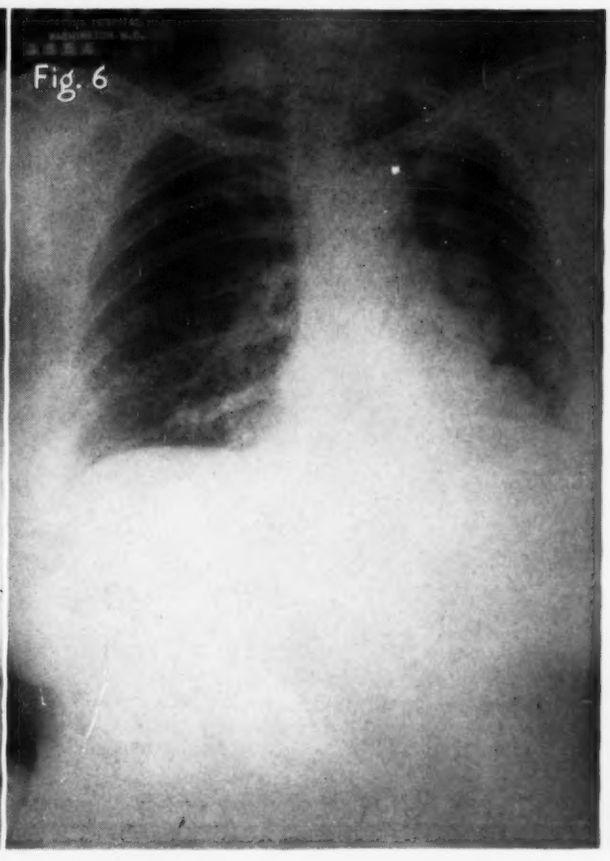
Factors important in the prognosis

The following factors should be observed at every radiologic examination in cases of pulmonary tuberculosis treated with artificial pneumothorax.

The first factor is the *mechanical effects of the collapse and the degree of compression of the lung.* Figure 4 shows approximately a 60 per cent collapse in all the lobes on the right. No cavities or pleural adhesions are seen, and there is no shifting of the mediastinum. Some thickening of the parietal

Fig. 5. An effective collapse with protrusion of the pneumothorax sac through the mediastinum into the opposite side.

Fig. 6. Same case, showing disappearance of the mediastinal hernia on inspiration.



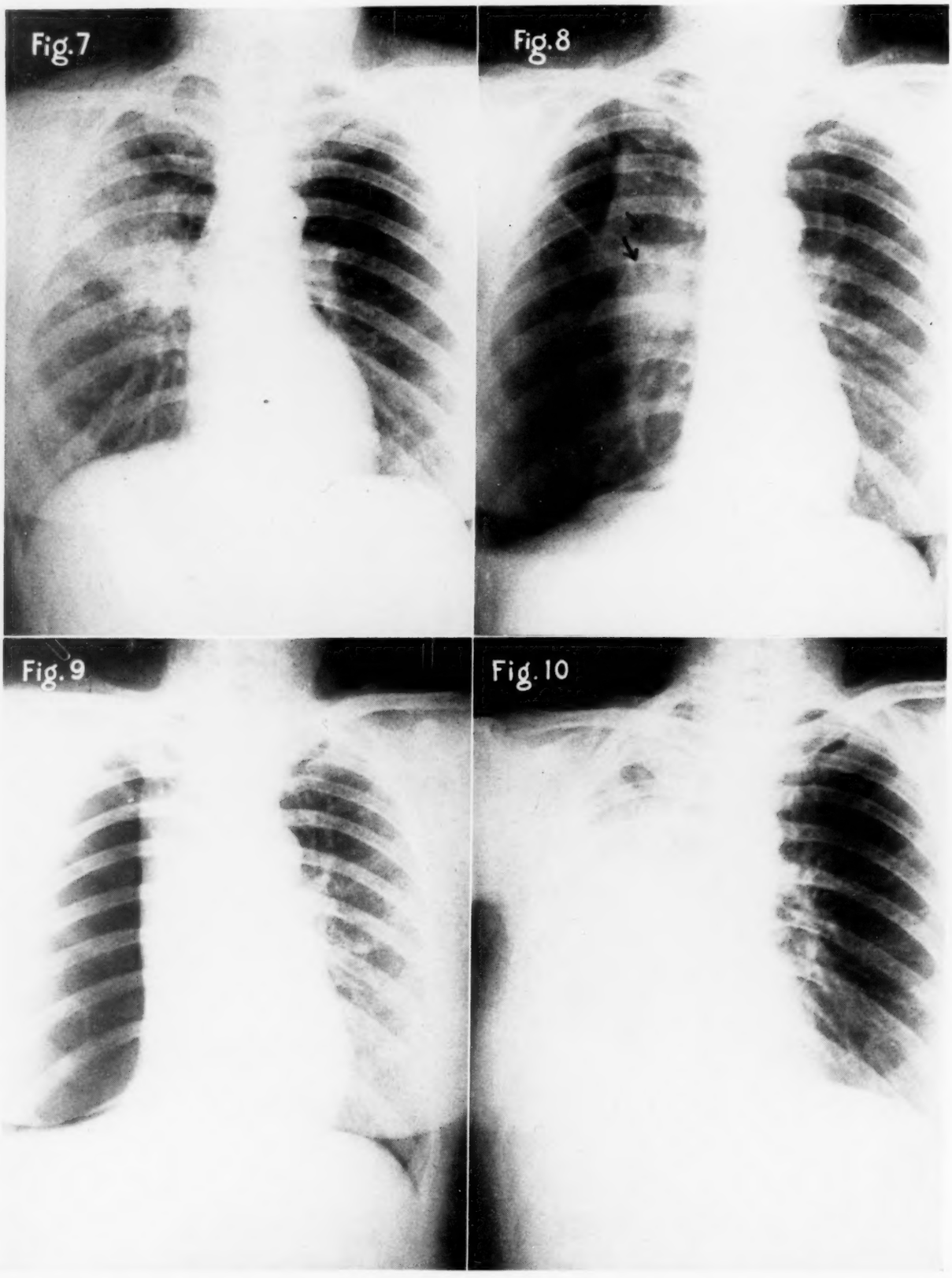


Fig. 7. Tuberculosis in the upper part of the right lung, with early cavitations in the second interspace (Courtesy of Dr. Dean Cole.)

Fig. 9. Satisfactory collapse obtained following pneumonolysis (Courtesy of Dr. Dean Cole.)

Fig. 8. Unsatisfactory collapse thought to be due to adhesions. The arrows point to open cavities (Courtesy of Dr. Dean Cole.)

Fig. 10. Extensive fibrosis limiting re-expansion of right lung. Compensatory hyperexpansion of left lung, with displacement of the heart and mediastinum into the right side of the chest.

pleura at the right base may be observed. There is no evidence of disease in the left lung. More compression is not necessary and would be unwise in this case[2].

Figure 5 shows an effective collapse, with a protrusion of the pneumothorax sac through the mediastinum into the opposite side. The mediastinal hernia can not be seen on inspiration (fig. 6). This mechanical phenomenon is usually of no significance, although it sometimes prevents closure of a cavity.

The second factor to observe is the *effect of pneumothorax on the cavity formation.* Incomplete collapse of a cavity is the most frequent cause for failure in pneumothorax therapy. The condition of the cavity can best be determined by x-ray examination, and often the factors causing the failure can be seen.

Figure 7 shows tuberculosis in the upper part of the right lung, with early cavitations in the second interspace. Artificial pneumothorax was begun, and figure 8 shows an

2. Dick, G. F. and others: The 1946 Year Book of General Medicine, Chicago, Year Book Publishers, Inc., 1946, pp. 261-263.

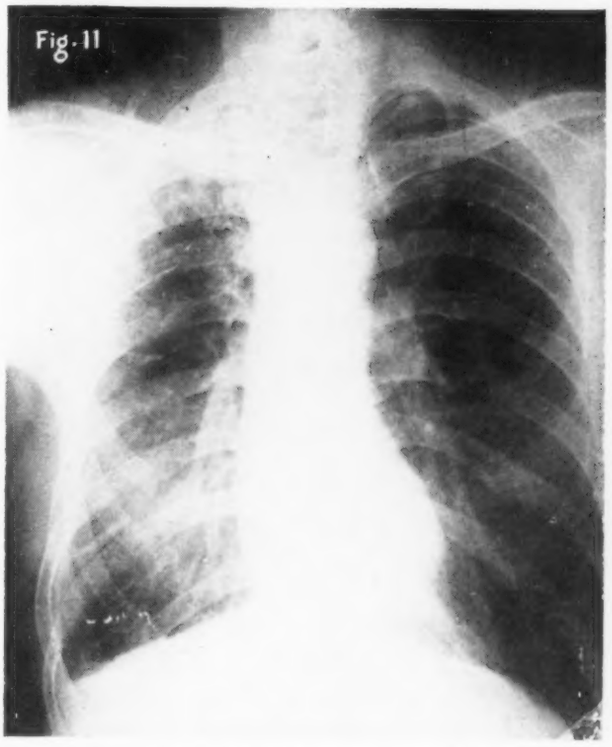


Fig. 11. Tuberculosis in the upper lobe of the right lung, with a small cavity just below the clavicle.

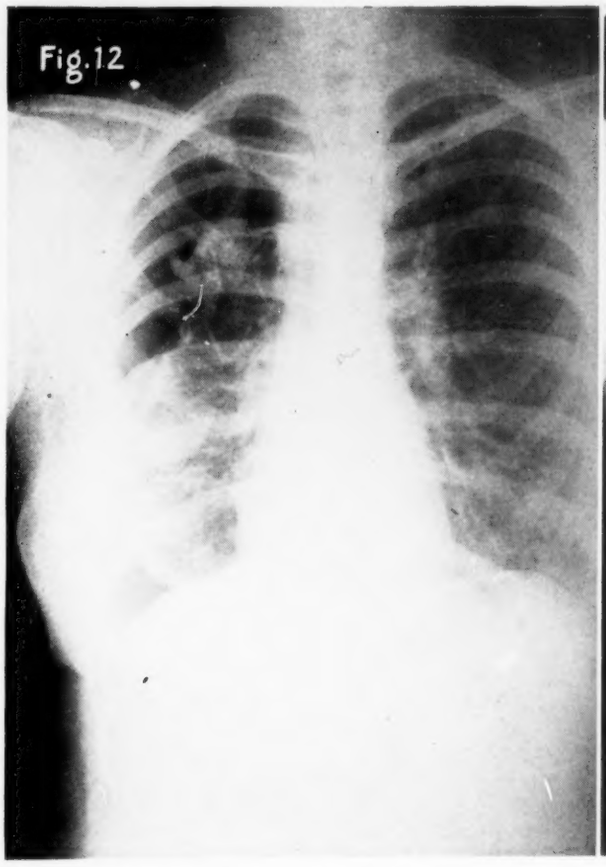


Fig. 12. Selective collapse in the upper lobe of the right lung, with comparatively healthy pleura.

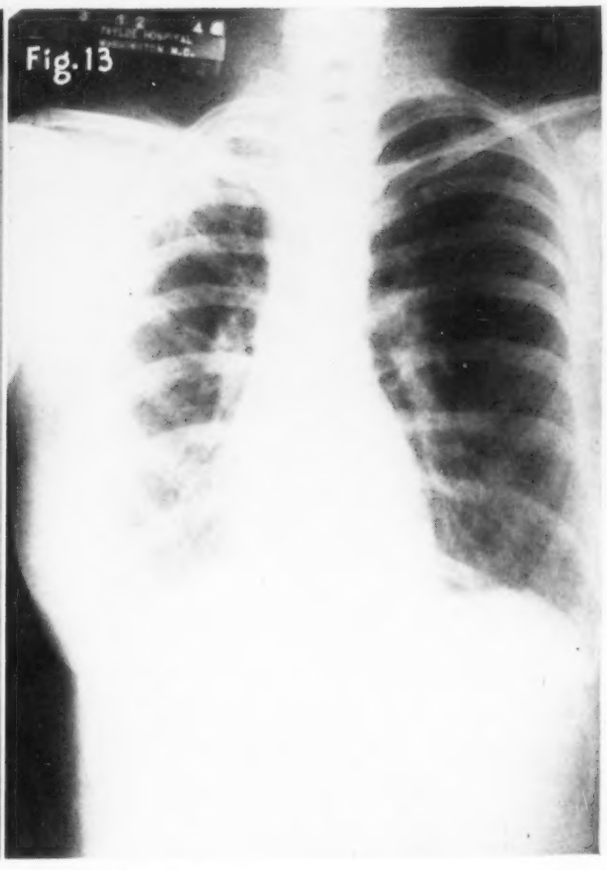


Fig. 13. Satisfactory re-expansion of the lung, with only a slight shift of the upper mediastinum.

unsatisfactory collapse thought to be due to the adhesions seen on this film. The arrows point to open cavities. Pneumonolysis was done, and a satisfactory collapse was obtained (fig. 9). Figure 10 is a film made several months after pneumothorax was discontinued. The diseased lung healed with such extensive fibrosis that its re-expansion was very limited. The contralateral lung shows a compensatory hyperexpansion, with a permanent displacement of the heart and mediastinum into the right side of the chest. This patient had no complications during her treatment, continuing her work during the entire time except for four weeks while the lung was being compressed and adhesions cut. Her present condition is excellent[3].

Figure 11 shows tuberculosis in the upper lobe of the right lung, with a small cavity just below the clavicle. The thickened pleura evident throughout this lung resulted from an old spontaneous collapse[4]. Because of the obliterative pleurisy it was not believed that air could be put into the pleural space in sufficient quantity to close this cavity; pneumothorax was attempted, however, but without success.

The third factor to consider is the *character of the pleura.* The pleura is permeable to both gases and fluids. When the pleura is healthy it absorbs the injected air fairly rapidly, and refills at frequent intervals are necessary. Figure 12 shows a selective collapse in the upper lobe of the right lung. The pleura appears comparatively healthy, and this individual had to have refills every twelve to fourteen days until treatment was discontinued after five years. Figure 13 shows that the lung has re-expanded satisfactorily, with only a slight shift of the upper mediastinum.

Figure 14 shows a thickened pleura resulting from fluid and empyema in the pleural space. The mediastinum is fixed and the pleura so thick that the lung can not re-expand. Thoracoplasty is probably indicated here.

The most serious complication of artificial pneumothorax is pleuro-pulmonary perforation. In figure 15 the condition is demonstrated by the injection of an opaque oil into a pulmonary cavity which resulted from drainage of an empyema. In tuberculosis this condition results from the rupture of

3. Tice, F.: Ambulatory Pneumothorax; Results of Ten Years' Experience, Am. Rev. Tuberc. 46:639-644 (Dec.) 1942.
4. Niehaus, R. F.: Simple Spontaneous Pneumothorax in Apparently Healthy Individuals; A Report of 24 Cases, Am. J. Roentgenol. 57:12-27 (Jan.) 1947.

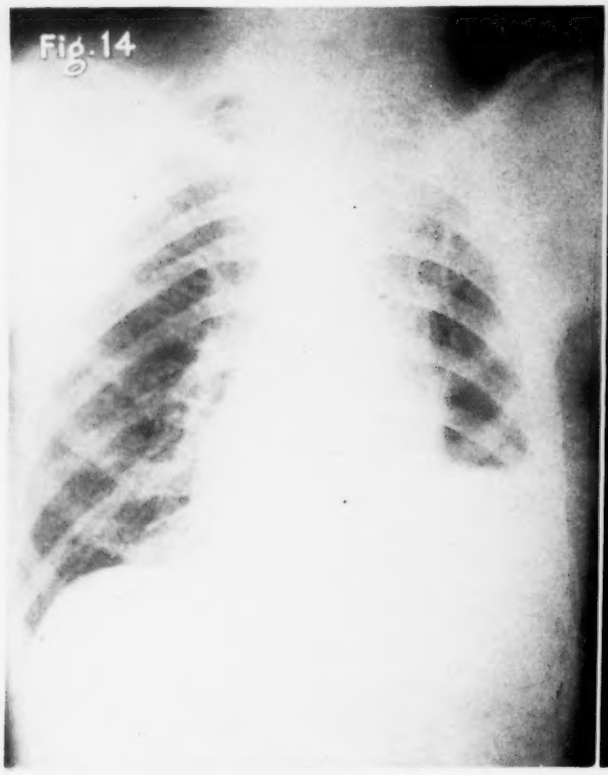


Fig. 14. Thickened pleura resulting from fluid and empyema in the pleural space.

Fig. 15. Pleuropulmonary perforation (Courtesy of Dr. Frederick Mandeville.)

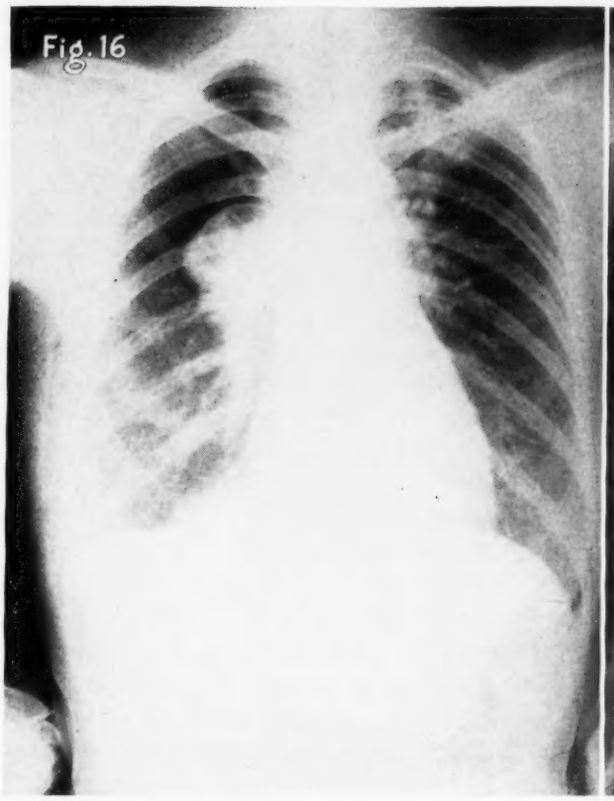


Fig. 16. Selective collapse of the upper lobe of the right lung, with obliterative pleurisy in the lower lobes.

Fig. 17. Bilateral pneumothorax with obliterative pleurisy on the left.

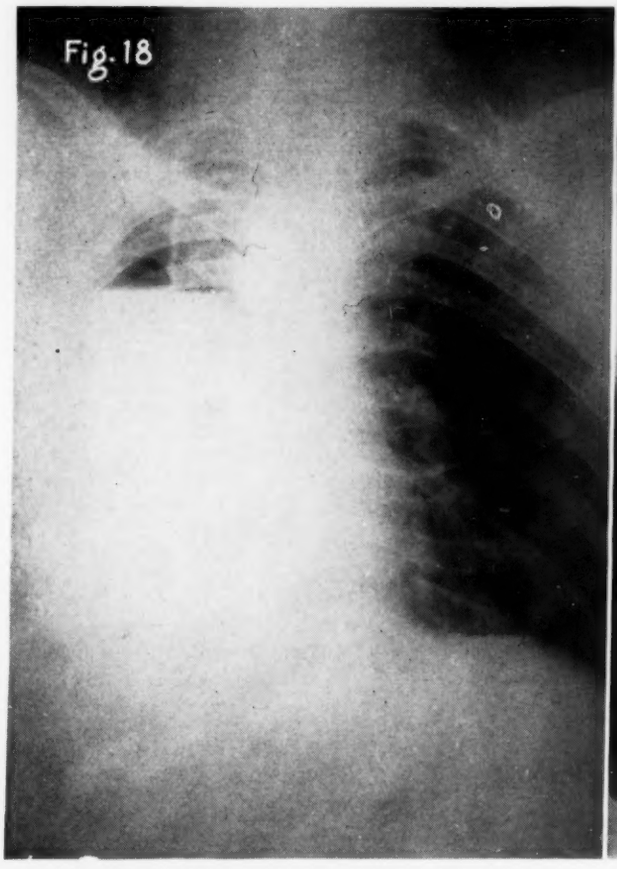


Fig. 18. Thickened and inelastic pleura produced by pleural effusion.

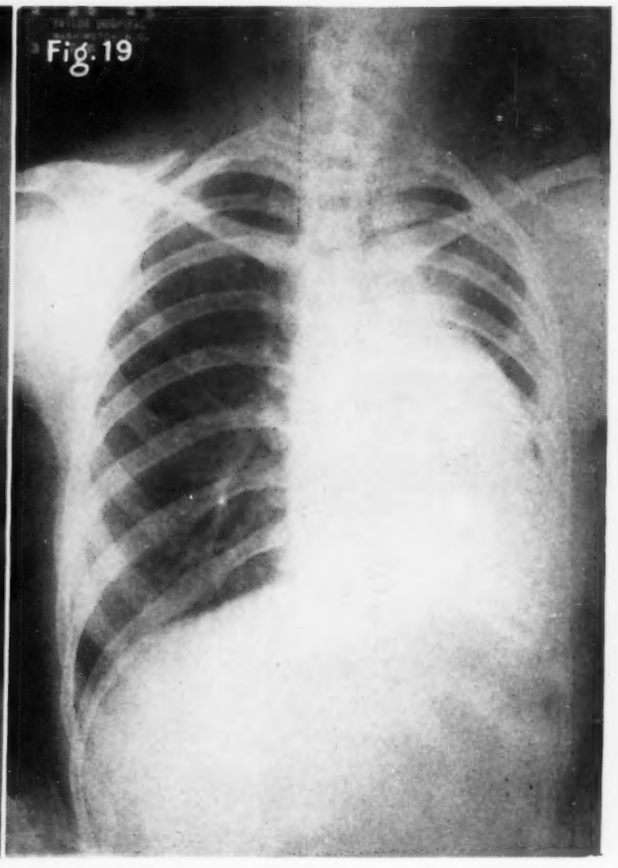


Fig. 19. Hyperexpansion of functioning lung.

a cavity or a caseous area into the pleural space, from the tearing of adhesions, or from a needle wound. Sauerbuck reported 57 cases, 43 of which were fatal within a week. Of 21 cases reported by Packard, Hayes, and Blanchet only 2 patients survived[5].

Figure 16 demonstrates a selective collapse of the upper lobe of the right lung, with obliterative pleurisy in the lower lobes. In this case the condition is not detrimental to the patient, since no disease is seen in the re-expanded lower lobes. Figure 17 shows a bilateral pneumothorax with obliterative pleurisy on the left. It will be impossible to continue refills on the left much longer, because the pleural space is being gradually obliterated.

The fourth factor to observe is the *presence or absence of fluid.* A large percentage of pneumothorax patients will show some fluid at some time during their treatment. The effusions are often slight and transitory, producing few or no symptoms. In some cases, however, large effusions develop which promptly recur after aspirations. They tend to become purulent. Figure 18 shows a case in which this condition has caused the pleura to become thickened and inelastic. It is improbable that this lung can re-expand, and operative interference may become necessary.

The fifth factor to observe is the *condition of the opposite lung.* Hyperfunction of the contralateral lung is brought about by increased blood supply and hypertrophy. If there is a shift of the mediastinum to the affected side, the functioning lung may become quite large (fig. 19). Spread of the disease into the healthy lung is a serious complication which should be detected as soon as possible.

The sixth factor to observe is the *re-expanding lung.* In following a re-expanding lung by x-ray examinations we need to know the original character and extent of the disease. The most important factor in deciding when to let a lung re-expand is the type of lesion present when the treatment

5. Packard, E. N., Hayes, J. N., and Blanchet, S. F.: Artificial Pneumothorax; Its Application in the Treatment of Pulmonary Tuberculosis, Philadelphia, Lea and Febiger, 1940, pp. 155-156.

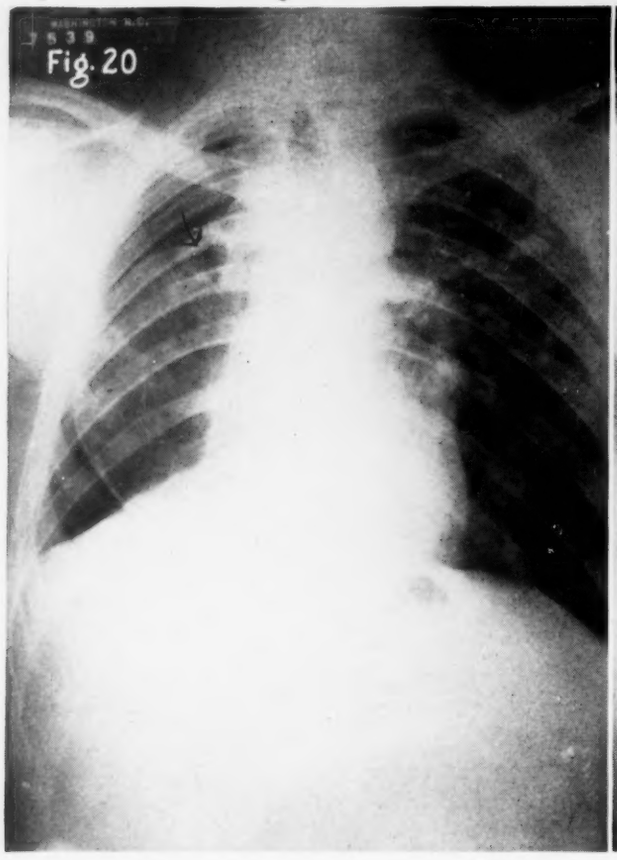


Fig. 20 Bilateral disease, with reappearance of a cavity (marked by arrow) following an attempt to let the right lung re-expand.

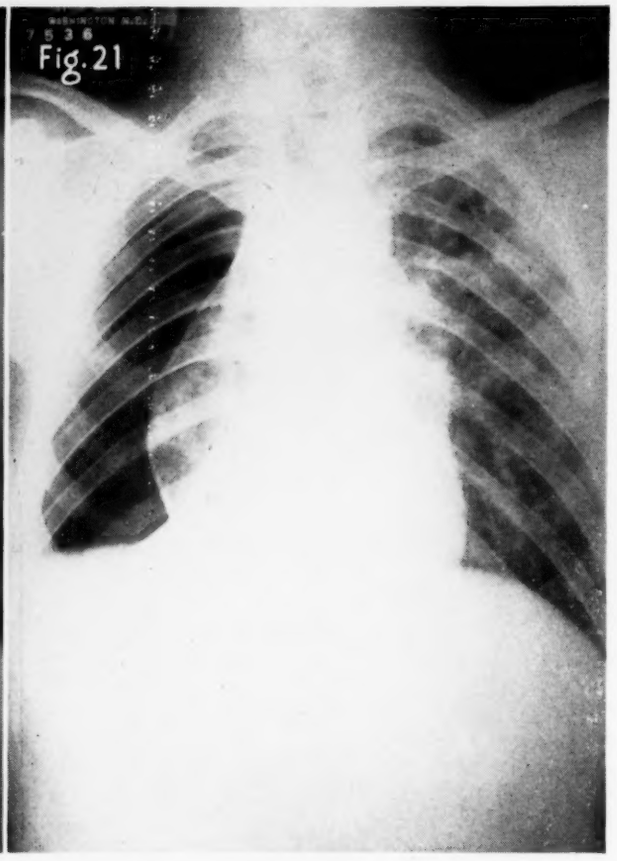


Fig. 21. The cavity seen in figure 20 has been obliterated by recompressing the lung.

was started[6]. A caseous lesion with no demonstrable cavitation does not require as long a period of treatment as do thick-walled cavities or fibrocaseous disease. When pneumothorax is being discontinued it is important to detect as soon as possible a re-expanding cavity or a spread. Fig. 20 shows a lung re-expanding on the right. In this case there was so much pathology on the left that some type of operative therapy was needed on that side. This could not be attempted, however, unless the right lung could be successfully re-expanded. Unfortunately, the reappearance of the cavity indicated by the arrow made it necessary to compress the lung again in order to close the cavity (fig. 21).

Conclusion

Artificial pneumothorax is used as a diagnostic aid and as a therapeutic agent. Most physicians are primarily interested in its use for treating pulmonary tuberculosis. X-ray films and fluoroscopic examinations made at regular intervals are essential in guiding the patient back to a useful life and maintaining him in good condition. The following factors should be observed at each examination:

1. Mechanical effects of the collapse and degree of compression of the lung.
2. Effect of pneumothorax on the cavity formation.
3. Character of the pleura.
4. The presence or absence of fluid.
5. Condition of the opposite lung.
6. Condition of the re-expanding lung.

6. Cake, C. P.: Indications for Terminating Artificial Pneumothorax, Virginia M. Monthly, 69:566-569 (Oct.) 1942.

The ultimate outcome in a minimal case can be favorably or unfavorably influenced by the type of follow-up observation and post-sanatorium living conditions. One must guard against relaxation of close medical supervision, an unregulated daily work tolerance, excessive social activities and economic and environmental deficiencies. — I. D. Bobrowitz, M.D., Allan Hurst, M.D. and Margaret Martin, Am. Rev. Tbc., Aug., 1947.

A hospital would not fail to provide a patient with a routine urinalysis and yet it is stated that only 0.4 per cent of cases of diabetes are discovered by such a routine procedure. The amount of significant tuberculosis discovered by providing a routine x-ray is much larger. It is also said that less than 1 per cent of patients provided a routine blood count have a blood dyscrasia. Less syphilis is found by providing routine Wassermanns than significant tuberculosis by providing a routine chest x-ray.— Allen Filek, M.D., 1947 Trans., NTA.

CESAREAN SECTION IN THE INTEREST OF THE MOTHER

JOHN T. WILLIAMS, M.D., F.A.C.S.*
BOSTON, MASSACHUSETTS

The primary aims of good obstetric care should be: (1) to safeguard the mother from serious injury or death; (2) to deliver a living child, free from injury, unhandicapped for its battle with life; and (3) insofar as it is consistent with the foregoing principles, to relieve labor pain.

Indications for Cesarean Section

Indications for cesarean section may be divided into fetal and maternal. Of the fetal indications, contracted pelvis with cephalopelvic disproportion, abnormal presentations with probable disproportion, and tumors blocking the birth canal are quite clear cut. Equally obvious are such maternal indications as placenta praevia, detachment of the normally situated placenta, pre-eclampsia, hypertension, chronic nephritis, and cardiac disease.

Many repeat cesarean sections and those performed in elderly primiparas are done in the interest of both mother and child. In some cases of disproportion, and especially in those where a trial labor proves unsuccessful, cesarean section must be considered in the interest of both mother and child. A difficult vaginal delivery may carry not only a distinct risk for the baby, but also the probability of serious damage to the mother.

Obstetricians have been criticized for selecting cesarean section in preference to a difficult forceps operation because the former is an easier procedure for the operator. In general, I think it may be said that the operation which is easier for the obstetrician will also be a great deal better for the patient.

Difficult vaginal deliveries are not without a considerable morbidity and occasional mortality due to hemorrhage and infection, and are certainly followed more often by chronic invalidism than is cesarean section.

A comparison of tables 1 and 2 shows that the percentage of cesareans performed for

* Formerly Assistant Professor of Gynecology, Harvard University Medical School.

Read at the Wrightsville Beach Symposium of the New Hanover County Medical Society, August 22, 1947.

Table 1

Indications for Cesarean Section

944 Cases at the New York Lying-In Hospital From Stander's Textbook of Obstetrics[1]

Contracted pelvis	33%
Antepartum bleeding	13%
Toxemia and allied conditions	8.4%
Previous cesarean (febrile puerperium)	11.8%
Disproportion	8.3%
Cardiac disease	3.4%
Abnormal presentations	3.4%
Tumors: ovarian cyst, cervical cancer, myoma, etc.	3.6%
Cervical dystocia	2.5%
Elderly primipara	5.1%
Ruptured uterus	0.6%
Tuberculosis: renal 2, pulmonary 5, hip 1	0.8%
Various	6.1%

Table 2

Indications for Cesarean Section

251 Cases at the Chelsea Memorial Hospital and Other Boston Hospitals between January 1, 1942 and June 30, 1947 (Author's Series)

Disproportion (including cases given test of labor)	154	60.3%
Primiparous breech and doubtful pelvis	9	3.5%
Previous cesarean (chiefly cases of disproportion)	37	14.7%
Fibroids obstructing delivery	2	0.8%
Previous extensive repairs	3	1.2%
Elderly primiparas (40 or over)	13	5.1%
Placenta praevia and separated placenta	24	9.5%
Pre-eclampsia, nephritis, hypertension, etc.	9	3.5%

purely maternal indications — antepartum bleeding, toxemia, and heart disease—was 24.8 in Stander's series, 14.2 in my own, including the patients with previous extensive repair. If those operations done for the benefit of both the mother and child are included, Stander's percentage of cesareans done wholly or partly in the interest of the mother is raised to 42.5, and my own percentage to 34.

My series of cases consisted exclusively of private patients, and extraordinary efforts were made to ensure the safety of both mother and child. Where doubt existed, cesarean section was done.

Forecasting the Outcome of Labor

Many factors enter into the outcome of labor. The most important of these are the size and type of the pelvis, and the size, presentation, and position of the fetus. Of great importance also are the age of the mother, the muscular development of the pelvic floor, the elasticity of the cervix, the strength of the uterine contractions, and the molding of the fetal head.

Some of these conditions can be determined only after an adequate test of labor. Each obstetric case is a problem to be considered individually, and can not be evaluated by a set of fixed rules. The age of the patient is a factor almost as important as the size and form of the pelvis. A primipara with a slightly undersized pelvis may have a successful labor if she is in the early twenties, whereas a similar patient in the middle thirties will not be able to have a vaginal delivery.

An endeavor should always be made to forecast the outcome of labor by careful antepartum examinations, including, when necessary, roentgen pelvimetry. When the outcome cannot be predicted accurately, however, one should not hesitate, under good aseptic conditions, to submit the patient to a test of labor. The prophylactic and therapeutic uses of penicillin and the sulfonamide drugs have so reduced the danger of abdominal delivery that, even in circumstances where the previous aseptic conditions may have been doubtful, one can resort to cesarean section without hesitation.

Pelvimetry

The type of the pelvis is important. In 1922[2] I published the first article on normal variations in the female pelvis and their obstetric significance. I recognized and described at that time the two types now known as the gynecoid and android. Later Caldwell and Moloy[3] added two more main types—the anthropoid and the platypelloid.

This classification into four groups has been of the greatest help in practical obstetrics. The gynecoid is, of course, the typical female pelvis, as described in the older obstetric textbooks, with thin bones, an elliptical or blunt heart-shaped inlet, and a wide arch. This type is found usually in the women of small build, although it sometimes occurs in obese and occasionally in large women. Many slight women give birth to large babies quite easily. Incidentally, the fact that these women usually have less well developed muscles and fasciae also helps to

1. Stander, H. J.: Textbook of Obstetrics, ed. 3, New York and London, D. Appleton-Century Co., 1945, p. 1082.

2. Williams, J. T.: Normal Variations in the Female Pelvis and Their Obstetrical Significance, Am. J. Obst. & Gynec. 3:345-351 (April) 1922.

3. Caldwell, W. E. and Moloy, H. C.: Anatomical Variations in the Female Pelvis and Their Effect in Labor with a Suggested Classification, Am. J. Obst. & Gynec. 26:479-505 (Oct.) 1933.

make their labor easier.

The android type of pelvis, as the name implies, has certain male characteristics, such as heavy bones, a V-shaped arch, and often a triangular or otherwise contracted inlet. Many of these patients, however, have a good inlet, with flaring hips and large external measurements. This type of pelvis is usually found in large, rather muscular women.

The anthropoid or ape-like pelvis is characterized by narrow transverse measurements but by long anteroposterior diameters. The bones are usually thin and the arch has a tendency to the V-shape. The posterior sagittal diameter of the outlet is usually ample, so that, although posterior positions of the occiput are unusually common in this type of pelvis, serious dystocia seldom occurs.

The fourth, or platypelloid type, is really a simple flat pelvis with ample dimensions. A long transverse diameter compensates for any reduction in the anteroposterior measurements.

There are many individual variations in these four types of pelves, and Caldwell has added several sub-groups: android-anthropoid, android-flat, anthropoid-gynecoid, gynecoid-flat, and others. It seems to me that these sub-classifications confuse rather than clarify the picture.

It is quite easy to recognize the four main types of pelvis by ordinary obstetric examination. X-ray pelvimetry, while desirable, is not absolutely necessary except in cases of suspected disproportion, or where there may be some doubt about the presentation of the fetus.

Thoms[4] of New Haven, who pioneered in radiographic pelvimetry, devised the Thoms grid—a lead plate with perforations at intervals of 1 cm. to allow accurate measurement of the superior strait.

In practice I have found the system of prenatal roentgenology worked out by Dr. Samuel A. Robins of Boston, while he was roentgenologist at the Boston Lying-In Hospital, very satisfactory. Robins' method is based on a combination of the Thoms technique and the Caldwell classification. It affords accurate measurements and a knowledge of the type of pelvis, both of which are important in predicting the course of labor.

4. Thoms, H.: Routine Roentgen Pelvimetry in 600 Primiparous White Women Consecutively Delivered at Term, Am. J. Obst. & Gynec. 37:101-106 (Jan.) 1939.

In the routine examination two films are taken: first, an anteroposterior view using the Thoms grid, with the superior strait parallel to the x-ray film; and second, a lateral film with the notched centimeter scale placed between the buttocks. Thus accurate internal measurements are obtained, and if the patient is near term the relation of the presenting part to the pelvic inlet is also clearly defined. Other important points observed are the thickness of the pelvic bones, the inclination of the sacrum, and the size of the sacro-sciatic notch.

I should like to bring out one more point about radiographic pelvimetry. After the observation of many labors following prenatal roentgenology, I am convinced that the figures given as normal for the internal diameters, and especially for the anteroposterior diameter of the inlet, should be revised upward. My experience has given me the conviction that 11 cm. is not the average normal for the true conjugate, but the lower limit of normal. I believe that the normal true conjugate is about 12 cm., and that any measurement below 11 cm. shows a definite contraction. The average transverse measurement is probably nearer the textbook figure of 13.5 cm.

Indications for Cesarean Section in the Interest of the Mother

Antepartum bleeding

Among the maternal indications for cesarean section, antepartum bleeding is of first importance. When premature separation of the placenta occurs in a patient who is not in labor and who has no dilatation of the cervix, cesarean section with transfusion is a life-saving operation for the mother. In patients with the so-called Couvelaire uterus a Porro operation might be indicated occasionally, but prompt recognition of the placental separation will render such an operation unnecessary and may result in saving the life of the child also.

Placenta praevia

There appears to be a remarkable unanimity of opinion that cesarean section is the treatment of choice in complete placenta praevia in the primipara, and even in multiparous patients. In the partial or even the marginal varieties of placenta praevia the amount of bleeding and the degree of dilatation of the os should decide the method of

treatment. Bleeding can be just as severe from a partial or even a marginal placenta praevia as from a complete placenta praevia. The obstetrician's first duty is to save blood. Where there is active bleeding, cesarean section offers the quickest method of control.

Toxemias of pregnancy

In the group of cases characterized by albuminuria and hypertension, and including pre-eclampsia, eclampsia, essential hypertension, and chronic nephritis, the decision to perform cesarean section will depend in part upon the severity of the condition, and to a still greater extent upon mechanical factors affecting delivery. In spite of the remarkable work which has been done on prenatal care, blood chemistry, and endocrine changes, there is still only one cure for pre-eclampsia, and that is delivery of the fetus.

In a mild or moderate case of pre-eclampsia in a young patient who is near term, whose cervix is soft, and in whom no cephalopelvic disproportion exists, simple rupture of the membranes, with or without the aid of castor oil and quinine and small doses of Pitocin, is usually adequate. Pituitary extracts containing the pressor factor should be avoided. Ergonovine should be used with care, and the blood pressure should be checked carefully after its administration.

On the other hand, if the patient is a primipara in her thirties who is not near term and who has a long, tight cervix, a rapidly rising blood pressure and increasing albuminuria, cesarean section under spinal anesthesia is indicated. In cases intermediate between these extremes, all the factors involved must be carefully weighed. Fixed rules can not be laid down, but if the outlook is not good for a reasonably quick delivery, a cesarean operation is usually indicated.

The anesthetic is of prime importance. General anesthesia is definitely contraindicated because it disturbs the blood chemistry, and has a toxic effect on the liver and kidneys. Spinal anesthesia does not affect the blood chemistry, the liver or the kidneys. In fact, by lowering the blood pressure and relaxing the spasm of the arterioles, it has a definitely beneficial effect.

When the condition has advanced to the convulsive stage, some modification of the Stroganoff[5] regimen is indicated, accompanied by the intravenous administration of hypertonic glucose solution, and concentrated magnesium sulfate solution either intramuscularly or intravenously. The time for delivery is when the patient ceases to improve under medical treatment. This is a matter for nice judgment, but many of these patients can be saved by cesarean section under spinal anesthesia who would otherwise be lost.

Heart disease

In patients with heart disease I feel that cesarean section has perhaps been overdone, possibly because it offers a favorable opportunity to sterilize the patient.

Young patients with well compensated rheumatic heart disease may go through two or three normal pregnancies and labors under good care without danger. Where mechanical difficulties are present, the patient must be protected from the undue strain of a difficult labor by an elective cesarean operation. In older patients and primiparas who have suffered some decompensation, a cesarean section will usually be indicated. Such patients should usually be protected from further pregnancies by sterilization.

The successful management of cardiac cases calls for the closest cooperation between the obstetrician, the cardiologist, and the anesthetist.

Neoplasms

Except for cervical cancer, neoplasms complicating pregnancy present a fetal rather than a maternal indication for cesarean section. If the tumor is so located as to obstruct delivery or to interfere with normal uterine contractions, a cesarean operation is indicated. It should never be done simply as a step toward removing the neoplasm, however.

Operative Technique

During the five and one half years from January 1, 1942, to June 30, 1947, in which my operative technique has been standardized, I have performed 251 cesarean sections without a maternal death. The operative technique has closely followed the low transverse cesarean described by Munro Kerr. I believe that the prophylactic use of penicillin and the sulfonamide drugs makes this simple technique applicable to all cases and renders unnecessary the complicated extraperitoneal

5. Stroganoff, T. W.: Ueber die Behandlung der Eklampsie, Zentralbl. f. Gynaek 21:1309, 1901.

techniques devised by Latzko and by Waters. The Porro operation should be restricted to those cases in which removal of the uterus because of fibroid tumors complicating pregnancy is indicated.

A four-inch median incision is made just above the symphysis pubis. The utero-vesical peritoneum is incised transversely and the bladder separated from the lower segment of the uterus. The uterus is opened transversely because only a transverse incision can be kept within the lower segment. The fetus is delivered, and the placenta comes away spontaneously or is expressed. The uterus is closed by two layers of continuous suture, the first one being interlocked with care to include all open sinuses. The bladder peritoneum is overlapped on the uterine peritoneum, and the abdomen is closed.

Certain points of technique are important to the success of the operation:

1. Spinal anesthesia is chosen in most cases because it has no effect on the baby, and because of the excellent relaxation obtained.

2. Preoperative medication should be minimal because of the effect on the baby. Scopolamine, 1/150 of a grain, is given one hour before the operation.

3. Before the incision is started, all instruments to be used in the early stages of the operation should be checked by the operator and laid out so that they can be placed in his hand in order without loss of time. All needles to be used in the operation should be threaded in advance. The suction apparatus should be turned on.

4. Immediately before the skin incision is made, 0.5 cc. of pituitary extract is given intramuscularly in the shoulder. While the uterus is being incised, one ampule of ergonovine is given intravenously. These two oxytocics produce prompt contraction of the uterus and reduce bleeding to a minimum.

5. The placenta often separates spontaneously, or it may be expressed by Crede's method, pressure being applied through the abdominal wall just as after a vaginal delivery.

6. If the patient is nervous or restless, 1/6 grain of morphine may be given intravenously at any time after the birth of the baby.

7. All steps of the operation should proceed with deliberation and precision. The only part of the operation in which haste is required is during the suture of the uterine incision.

8. Additional intravenous ergonovine should be given if bleeding is excessive.

Conclusions

Fourteen to 24 per cent of cesarean sections are performed in the interest of the mother, for such indications as antepartum hemorrhage, pre-eclampsia and allied conditions, heart disease, carcinoma of the cervix, and other neoplasms.

If to these indications are added primiparity in an elderly patient, previous cesarean section, and previous extensive repair operations, the percentage of operations performed in the interest of the mother is raised to 34-42 per cent.

In cases where there are possible mechanical indications for cesarean section, consideration should be given to the future welfare of the mother as well as to the safety of the child.

Attention to many important details of technique has made cesarean section probably safer for the mother than a difficult vaginal delivery.

429 Beacon Street.

The shortage of scientific personnel.—In our usual way when we set out to do a job, we do it to the exclusion of everything else—the long-term considerations always can go hang. We set out to do the job of winning the war to the whole extent of our ability to contribute to victory, and that is the job we did. We stopped almost completely the training of men not only in fields of science and technology but in all fields. With the exception of students of medicine and engineering in Army and Navy programs and some 2,400 men on the reserve list who were taken from their studies for civilian war research, all physically fit students, graduate and undergraduate, and those ready for college over 18 years old, were taken into the armed forces and were kept there. This went on for five years. What you take five years to undo in reference to training people for a vital function in the Nation's interest, you cannot make up in any lesser amount of time. And unless you do twice as much training for five years following the five blank years as you were doing before those years, you are going to lose up to five years of production of scientists. This is just elementary arithmetic and, furthermore, serious as arithmetic shows the situation to be, there is no doubt that a higher calculus, if it could be made, would show it to be still more serious.—Henry Allen Moe: The Shortage of Scientific Personnel, Science 105:195 (Feb. 21) 1947.

PAROXYSMAL COLD HEMOGLOBINURIA

Report of Two Cases

RALPH G. FLEMING, M.D.
DURHAM
and
BAIN L. HEFFNER, M.D.
GREENSBORO

Paroxysmal cold hemoglobinuria is a condition characterized by hemolysis of red blood cells and excretion of hemoglobin in the urine following exposure to cold. It is considered a manifestation of congenital or late acquired syphilis. In 1866 Gull[1] recognized the relationship of hemoglobinuria to cold, and in 1880 Murri[2] emphasized the fact that patients with paroxysmal cold hemoglobinuria frequently had syphilis. Mackenzie[3] stated that in 30 per cent of such cases clinical examination revealed evidence of syphilis, and that with the Wassermann test it was possible to demonstrate syphilitic infection in more than 90 per cent. Donath and Landsteiner[4] found that there was evidence of syphilis in 95 of the 99 cases reported in the literature between 1906 and 1925; there was a positive Wassermann reaction in 81, and clinical evidence or a history of syphilis in 24.

Mechanism of Hemolysis

In 1904 Donath and Landsteiner[5] demonstrated the mechanism of the intravascular hemolysis when they found that the serum or plasma of these patients contains an autohemolysin which unites with the red blood cells at a low temperature, causing lysis when the cells are subsequently warmed. The origin of the autohemolysin is unknown, but it is suggested[6] that it is produced in response to an antigen liberated from the spirochetes, from organs infected by syphilis, or from both. There is no explanation as to why some patients with syphilis develop autohemolysins and others do not. Autohemolysins may be present in a small percentage of cases of late syphilis without clinical symptoms of hemoglobinuria.

1. Gull, W. W.: Intermittent Hematinuria, Guy's Hosp. Rept. 3rd ser. 12:381-392, 1866.
2. Murri, A.: Riv. clin di Bologna, No. 2, 3, 1880; quoted by MacKenzie.
3. MacKenzie, G. M.: Paroxysmal Hemoglobinuria: A Review, Medicine 8:159-191 (May) 1929.
4. Donath, J. and Landsteiner, K.: Ueber Kæltehæmoglobinurie, Ergebn. d. Hygiene 7:184, 1925.
5. Donath, J. and Landsteiner, K.: Ueber Paroxysmale Hæmoglobinurie, Muench. med. Wchnschr. 51:1590-1593 (Sept. 6) 1904.
6. Nanba, M.: Ueber die kuenstliche Erzeugung des Autohæmolysins, Deutsche med. Wchnschr. 51:594-595 (April 10) 1925.

Symptoms and Signs

The clinical manifestations of this condition are classical. Following exposure to cold, either general or local, the patient experiences within a very short time chilliness, nausea, malaise, weakness, pains in the abdomen, legs and back, paresthesias of various parts of the body, and a rise in temperature of one to four degrees. Vasomotor disturbances such as urticaria, fluctuating blood pressure, and Raynaud's phenomenon may occur. One to four hours after chilling the urine becomes dark red or mahogany in color, but usually returns to normal within five to eight hours. Within a few hours after the patient removes himself to a warm environment, all symptoms disappear, except for mild nausea and lassitude, which persist for twenty-four to thirty-six hours. If a large number of red blood cells are hemolyzed, the sclerae and skin may show transitory icterus. Between paroxysms the patient is perfectly normal. Physical examination may reveal stigmas of syphilis, and the liver and spleen are sometimes palpable during an attack.

Laboratory Findings

Significant laboratory findings are related to the blood and urine. The Donath-Landsteiner test is positive. Positive Kahn and Wassermann tests can be demonstrated in the majority of cases. During a paroxysm the blood serum and urine contain hemoglobin. The urine is dark red to mahogany in color; it contains albumin and casts, and a few red blood cells may be demonstrated. The blood serum is colored pink or red, and the icterus index and bilirubin rise. Spectroscopic examination of the urine reveals that the color is due to oxyhemoglobin, methemoglobin, and sometimes hematin. Moderate leukocytosis usually accompanies the paroxysms, and is followed by leukopenia and relative lymphocytosis.

Treatment

Numerous forms of treatment for this condition have been tried, but only antisyphilitic therapy has proven of definite benefit. Untreated patients continue with recurrences of hemolytic episodes for years,

but with intensive and prolonged treatment for syphilis the attacks may cease and the autohemolysins disappear from the blood or decrease in titer.

Case Reports

Case 1

A 36-year-old white male of German-Irish extraction was admitted to the Regional Hospital, Fort Bragg, North Carolina, on November 15, 1944, with the complaint of passing "bloody urine" each time he had been chilled by exposure to cold during the past twelve years. This had occurred on three occasions during his army service of one month. Symptoms of nausea, a feeling of fullness in the upper abdomen and lower chest, chilly sensations followed by profuse sweating, and pain in the back and extremities had been associated with each attack, and had preceded the appearance of red urine by two to three hours. The patient had learned that if he went to bed and got warm all symptoms would subside within four to five hours. The attacks had occurred mainly in the winter, but occasionally had been precipitated by getting his feet wet in summer. Hemoglobinuria was never experienced after drinking cold fluids, and the attacks were not related to long walks or other physical exertion. There was no history of anemia. He had frequently noticed that his eyes were yellow after he had had several paroxysms in rapid succession.

Blood Wassermann and Kahn tests performed when the patient was inducted into the army in October, 1944, had been positive. The spinal fluid was normal. He was started on antisyphilitic therapy, and had received seven intravenous injections of mapharsen and three intramuscular injections of bismuth prior to admission to the hospital. He had no knowledge as to when he might have contracted syphilis, and denied ever having had a penile lesion or skin rash. Two years before he entered the army, a Wassermann test was done by his physician, who informed him that it was negative. There was no history of syphilis in his parents. After he was informed that he had syphilis, his wife and two children (both apparently healthy) were examined for this disease and were found to have negative serologic tests. The family history was otherwise irrelevant.

Physical examination revealed a moderately obese individual with tattoo marks on both upper extremities. The systolic blood pressure varied between 140 and 110, and the diastolic pressure between 90 and 75 over a period of three days. A functional systolic murmur was heard at the apex of the heart. There were no findings to suggest congenital or late syphilis. The neurologic examination was negative.

The Donath-Landsteiner test and the Wassermann and Kahn reactions of the blood were positive. Repeated urinalyses were negative. The renal function as measured by urea clearance was 115 per cent of average. A phenolsulfonphthalein kidney function test revealed an output of 22 per cent in fifteen minutes, and a total of 67 per cent in one hour.

The red cell count was 4,990,000 and the hemoglobin was 14.8 Gm. by photoelectric

Table 1

Laboratory Studies of the Blood Serum and Urine Before and After Chilling in Case 1

SPECIMEN and TEST	*BEFORE CHILLING*	*AFTER CHILLING* (Feet in Ice Water for 10 Minutes) 1 Hour	3 Hours	5 Hours	7 Hours
Blood Serum					
Color	Normal	Pink	Faint pink	Yellow	Yellow
Icterus index	9	25	34	28	22
Van den Bergh					
Direct	Negative	Negative	Negative	Negative	Negative
Indirect	0.2 mg./100 cc.	1.7 mg./100 cc.	4.5 mg./100 cc.	3.6 mg./100 cc.	2.4 mg./100 cc.
Urine					
Color	Straw	Amber	Dk. reddish brown	Amber	Amber
Reaction	Acid	Acid	Acid	Acid	Acid
Specific Gravity	1.022	Q. N. S.	1.008	1.005	1.011
Albumin	Negative	+	++	Trace	Sl. trace
Benzidine	Negative	++++	++++	+++	Trace
Bile	Negative	Negative	Negative	Negative	Negative
Microscopic	Normal	Numerous granular casts	Normal	Normal	Normal

determination. The white blood cells numbered 9,650, and the differential count showed 68 per cent polymorphonuclear leukocytes and 32 per cent lymphocytes. The hematocrit was 45 per cent. The reticulocytes numbered 2.3 per cent, and the platelets 225,000. The venous clotting time was fourteen minutes and the bleeding time was five and one half minutes. The red blood cell fragility test was normal. His blood group was O, and he was Rh-negative.

The total serum proteins were 8.1 Gm. per 100 cc., with 5.1 Gm. of albumin and 3.0 Gm. of globulin, the albumin-globulin ratio being 1.7. The blood nonprotein nitrogen was 33 mg. per 100 cc., and the cholesterol 169 mg. per 100 cc.

Roentgenograms of the lungs and skull, and of the entire spine and pelvis were normal. Numerous well-defined gallstones were demonstrated by a flat plate x-ray of the abdomen.

This patient was unusually sensitive to cold, and a paroxysm could be precipitated by exposure to a temperature of 30-40 F. for fifteen minutes. On three occasions the patient was asked to place his feet in ice water for ten minutes. Each time an attack of hemoglobinuria, with the associated symptoms previously described, was produced. Table 1 shows the rise in the icterus index and serum bilirubin and the urinary abnormalities which were characteristic of each experiment. Spectroscopic examination of the serum and urine revealed reduced hemoglobin (oxyhemoglobin).

Case 2

A 30-year-old soldier of Italian extraction, with two weeks' military service, was admitted to the Regional Hospital, Fort Bragg, North Carolina, on December 4, 1942, complaining of the passage of "blood in the urine" following exposure to cold during calisthenics. A urinalysis done prior to hospitalization showed a 4 plus reaction for albumin, a positive (4 plus) benzidine test and many granular casts and red blood cells. A tentative diagnosis of nephritis was made.

The history revealed that he had voided dark, brownish-black urine after exposure to cold on numerous occasions since early childhood. His mother had noted this phenomenon when he was a few weeks old, and the patient recalled that since the age of 6 exposure to cold for thirty to forty minutes during the winter months would produce attacks of generalized aching and malaise, and his urine would be dark "brownish-black" for a period of five to six hours. He had learned that such attacks could be prevented by dressing in extra heavy clothing if he were out of doors for long periods of time during cold weather.

In 1937, because of the newspaper publicity given the venereal diseases, the patient had a blood Wassermann test performed. This was reported positive, and during the next year he received fifty-two intravenous and fifty-two intramuscular "shots" at weekly intervals. A Wassermann test was negative following this therapy, and he had no further treatment until 1939, when a serologic test for syphilis was again found to be positive. He received an additional forty intravenous and forty intramuscular "shots" at weekly intervals. A Wassermann test of the blood following this treatment was negative, and tests of his blood and spinal fluid made just before he entered military service were negative for syphilis. He gave no history of a chancre or skin eruption, and the family history was negative for syphilis.

Physical examination revealed a well developed and nourished male in no acute distress. The temperature was normal. There were no stigmas of acquired or congenital syphilis. Complete physical and neurologic examinations were negative except for occasional premature heart beats.

Urinalyses were normal, except for the presence of pus cells (few to numerous) over a period of several days. Blood counts and a fragility test of the red blood cells were normal. Serologic tests of the blood for syphilis revealed one positive Wassermann, one negative Wassermann, three doubtful Kahns, and two positive Kahns. The spinal fluid was normal. A Donath-Landsteiner test was positive. Kidney function, as measured by phenolsulfonphthalein and urea clearance tests, was within normal limits The blood nonprotein nitrogen was normal. Cystoscopic examination and a retrograde pyelogram revealed no evidence of disease in the upper or lower urinary tract. An electrocardiogram was normal except for premature contractions. A roentgenogram of the heart and lungs was normal.

It was the opinion of the venereal disease consultant that the patient had received ade-

quate treatment for syphilis. Antisyphilitic therapy had not altered the attacks of hemoglobinuria, either in frequency or severity.

On several occasions the patient was asked to place his hands and feet in ice water for fifteen minutes. Each time an attack of paroxysmal hemoglobinuria was produced, and the urine passed for two to six hours after each experiment was dark, reddish-brown; it contained albumin and gave a 4-plus reaction to benzidine, though no red blood cells could be demonstrated in any specimen.

Comment

Paroxysmal cold hemoglobinuria has been considered a rare condition. In 1932 McCarthy[7] stated that less than 300 cases had been reported. Since, in a relatively short period of time, the condition has been encountered in 2 individuals who stated that they had been treated by numerous physicians, none of whom had detected the true nature of their illness, one might surmise that this assumption of rarity may be due to the low index of suspicion on the part of the physician for paroxysmal cold hemoglobinuria.

It also appears to us that the rather universal assumption that paroxysmal cold hemoglobinuria is usually, if not always, a manifestation of syphilis is open to some question. There was no evidence of syphilis, except positive serologic tests, in the 2 cases we are reporting, and the diagnosis of syphilis in a large percentage of the cases in the literature seems to be based only on this finding. It is possible that the positive serologic tests for syphilis encountered in many cases of paroxysmal cold hemoglobinuria may be biologic false-positive reactions. Neurath and coworkers[8] report promising new serodiagnostic methods for differentiation between syphilitic and biologic false-positive sera, and it is suggested that these tests be applied in cases of paroxysmal cold hemoglobinuria encountered in the future.

7. McCarthy, Francis P. and Wilson, Robert, Jr.: Paroxysmal Hemoglobinuria, Report of Cases, with Familial Findings, New England J. Med. 207:1019-1022 (Dec. 8) 1932.
8. Neurath, H., and others: The Serological Diagnosis of Syphilis, Science 101:68-69 (Jan. 19) 1945.

The steadily increasing industrial employment of women in this country has not as yet been reflected in a higher tuberculosis mortality in women, even at the ages of highest susceptibility. — Henry D. Chadwick, M.D. and Alton S. Pope, M.D., The Modern Attack on Tuberculosis, The Commonwealth Fund, Revised, 1946.

ALCOHOLIC BEVERAGES AND ALCOHOLISM

FREDERICK R. TAYLOR, M.D., F.A.C.P.
HIGH POINT

Many of the data presented here are taken from the recent collection of lectures given at the Yale Summer School of Studies on Alcohol and published in book form under the title of ALCOHOL, SCIENCE AND SOCIETY by the *Quarterly Journal of Studies on Alcohol*[1].

In this book Dr. Jellinek states that there are about 100,000,000 men and women of drinking age (15 years and over) in the United States, about one half of whom use alcoholic beverages. Of these, about 3,000,000 use alcohol excessively, running a serious risk of becoming compulsive drinkers and of developing chronic alcoholic disease.

Physiologic Effects of Alcohol

Haggard says that in ordinary alcoholic beverages, ethyl alcohol is the only alcohol of importance, and that even amyl alcohol, the much berated fusel oil, is of no significance. In a man weighing about 150 pounds ethyl alcohol is oxidized by a normal liver at the rate of about 7 to 10 Gm. per hour—that is, the amount in about 0.6 to 0.8 fluid ounces of whisky. During the process, the very toxic acetaldehyde is formed, but is oxidized so fast that it has no detectable effect on the individual. Adulterants such as wood alcohol are excluded from this discussion.

Unlike sugar and fat, alcohol cannot be stored in the body. Though oxidized continually as long as it is in the body, it is practically always ingested faster than it can be oxidized, so that some of it is eliminated in the breath and urine.

While undiluted distilled liquors cause severe local irritation of the mucous membranes from the mouth to the stomach, there is, according to Haggard, little irritation from alcohol in concentrations of less than 15 or 20 per cent, and none below 5 or 6 per cent. Haggard also states that about 30

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From the Department of Internal Medicine, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, North Carolina.

1. Alcohol, Science, and Society, New Haven, Connecticut, Quarterly Journal of Studies on Alcohol, 1945.

or 40 per cent of the alcohol swallowed may be absorbed directly through the stomach wall, though most food and drink are not. The rest is absorbed, as are most other things, through the intestinal wall. If the alcohol content of the beverage is more than 4 or 5 per cent, the stomach secretes fluid which dilutes it down to that strength. Alcohol taken on an empty stomach is of course absorbed much faster than alcohol taken with a meal.

Haggard says that deaths from bad bootleg liquor were due to wood alcohol, not to fusel oil, as some claimed. He also states that taking two or more kinds of drinks in succession causes no more intoxication than taking two or more drinks of the same kind, with equal alcohol content, in equal amounts, and under like conditions.

The intoxicating level of alcohol in the blood

Even in severe intoxication, the alcohol concentration in the blood stream is low, for 0.7 to 0.9 per cent is a fatal level. This concentration is very rarely reached, since stupor usually intervenes and prevents the subject from drinking a lethal amount.

The concentration of alcohol in the blood is important medicolegally. According to Greenberg, if it is 0.05 per cent or less, a person is definitely *not* under its influence to a degree where he cannot safely operate a motor vehicle. If it is 0.15 per cent or more, he definitely *is* under its influence. Between these levels, some persons are intoxicated and some are not, according to individual susceptibility. Many believe that the law should make 0.05 per cent the legal limit for driving.

Since the concentration of alcohol in the blood bears a fixed ratio to that in the breath, the blood does not have to be taken to determine its alcohol content. Greenberg has devised a practically fool-proof "alcoholometer" which tests the breath, makes automatic records, and expresses the results in terms of blood concentration. It can be operated by any intelligent police officer. If anything goes wrong, either no record is made, or the error is in favor of the accused, so that he cannot be wrongly convicted by the instrument. It is legalized in Connecticut and used by the state police there.

Effects of alcoholic excess

It is obvious that the concentration of alcohol in the blood is too low to be dehydrating. The most probable explanation of intoxication is that alcohol disturbs oxygen metabolism in the cells. The symptoms are very like those produced by flying at high altitudes without oxygen.

It is superfluous to point out to this audience that alcohol is not a stimulant, but a depressant, or that most physical diseases produced by alcoholism are due in part, at least, to a vitamin lack. Jolliffe says that we do not yet know how alcoholic wet brain and Korsakoff's psychosis are brought about, but cirrhosis of the liver, multiple neuritis, Wernicke's disease (acute hemorrhagic polioencephalitis), delirium tremens, and alcoholic pellagra are due especially to the lack of thiamine or niacin. These deficiencies may be caused in two ways. Whisky, since it cannot be stored and is totally devoid of vitamins, replaces food only in energy-production. The whisky drinker is not likely to eat as much as usual; even if he does, however, storing as fat or glycogen the food not used as energy or protein replacement, we now know that there is a direct relationship between caloric intake and vitamin requirement. The more calories we take, the more vitamins we need. This finding explains the hitherto puzzling fact that avitaminoses do not occur in total starvation. When too many *extra* calories are ingested as alcohol, the normal vitamin intake becomes inadequate. The fact that many conditions, such as polyneuropathies, may become irreversible, however, suggests that alcohol in itself may be a destructive nerve poison.

It is well known that 3 ounces of whisky will usually impair efficiency. Occasionally a paradoxical reaction may occur, as Jellinek shows, in the following manner: A young man, practicing marksmanship alone, makes a score of 10 without alcohol. Alcohol brings his score down to 7. In competition, however, the man "gets rattled" without alcohol, and his score is only 4. Alcohol inhibits his conflicts due to shyness and embarrassment, and brings his score up to 7, but never to 10.

Causes of Alcoholism

The incidence of alcoholism is high among children from alcoholic homes. Since, however, the incidence is no higher than normal among children of alcoholic parents who are moved in infancy to non-alcoholic homes, it appears that this is an environmental rather than a hereditary effect. An alcoholic parent

not only sets the example of alcoholism, but tends to neglect children and to produce tensions in them.

In cases of marital discord connected with alcoholism, it is of some importance to know whether alcoholism or the discord is primary. Each may create or aggravate the other, setting up a vicious circle. There is, of course, no type of personality that cannot become alcoholic, as there is no type which is inevitably, under all circumstances, doomed to alcoholism.

Cost of Alcoholism

Benson Y. Landis calculates the economic cost of alcoholism to the United States in 1940 at a grand total of nearly $779,000,000. This figure includes the cost of mental and physical diseases, accidents with injury and property damage, crime due to alcoholism, the maintenance of alcoholics in jails and prisons, and wage losses. Landis recommends setting up Yale-plan alcohol clinics wherever possible, with the suspension of sentences for drunkenness on condition that the alcoholics attend these clinics and carry out their treatment until they are discharged.

Donald S. Berry, director of the Traffic and Transportation Division of the National Safety Council, says that the average driver of a car with about 0.15 per cent of alcohol in his blood is fifty-five times more likely to be involved in a personal injury accident than a driver with no alcohol. One fifth of daylight accidents are associated with a drinking driver, one third of those during the hours of darkness.

Is Total Abstinence the Answer?

The consideration of total abstinence movements is a part of the study of the alcohol problem, for they aim at prophylaxis. The best exposition of the philosophy of these movements which I have seen is that of Mr. Harry S. Warner, who states that the exponents of total abstinence believe that the natural, healthy way of life is non-alcoholic.

"That alcoholic pleasure in restrained, moderate degrees is widely sought and socially approved is obvious, . . . but this social practice is regarded as unworkable . . . while large numbers continue moderate in their use of alcohol throughout life . . . the pleasure afforded those who do is not sufficient to offset the excesses of those who do not, and never will, maintain moderation . . .

"The attitudes of the community are vital, both as to cause and as to cure. The majority of all who become intemperate, whatever their background, even the compulsive drinker, who is so because of inner emotional conditions, learned to count on alcohol in some social group, because of social approval, in their younger days. Social invitation and suggestion, the desire to conform to expectations, to be one of the group, especially not to be a 'wet blanket,' are the starting points of moderate and heavy drinking alike . . .

"The man of strength is no less strong for choosing not to add to the unhealthy pressures that burden the weaker . . . "

Treatment of Alcoholics

Brief jailing or long imprisonment may be necessary in certain cases of alcoholism to protect society, but it does not cure the alcoholic. After release from confinement for a few days or many years, the alcoholic usually gets drunk very promptly, according to Hon. William M. Maltbie, Chief Justice of the Supreme Court of Connecticut.

Medical treatment usually consists of either the conditioned reflex method or psychotherapy. The former is brief and less costly, but has to be repeated at intervals. The latter, when successful, is more lasting, but is unavoidably expensive in time and money. It is, of course, essential to distinguish between ordinary alcoholism and drinking that is symptomatic of a psychosis, a psychopathic personality, or a focal brain lesion or injury. It is useless to treat alcoholism in such people, unless the primary trouble can first be eradicated.

Although revival meetings have some remarkable cures to their credit, they are notoriously inefficient. The alcoholic who goes on an emotional debauch in every such meeting and "gets converted," only to get drunk the next day, is all too common. Very many alcoholics, of course, do not attend such meetings. Individual pastoral counseling may help or hurt, according to the training, insight, and understanding of the pastor. It is a fine thing that so many ministers are attending the Yale Summer School sessions. A year under a capable hospital chaplain is most valuable, for there the minister learns the basic nature of many psychosomatic conditions, including alcoholism.

In recent years, I have found that the most widely effective method of treatment is to refer the patient to an active local chapter of the Fellowship of Alcoholics Anonymous. However, to profit from their treatment, or from any other, the patient must recognize that he needs help and must want to get well.

In such a case, no amount of trouble is too great for the organization to take to help him, and he does not have to have money. I use it as the court of *first* resort, rather than of last, for my alcoholic patients *who want help and are willing to strive for life-long total abstinence.* The members have no "holier-than-thou" attitude, and they can penetrate all rationalizations and pretexts, because they have been through the same process and know all the complex tricks of the alcoholic. Probably the most important thing in their method of treatment as contrasted with other methods—psychologic, medicinal, or religious—is their insistence that their members promptly take an active part in helping other alcoholics. This is the finest type of occupational therapy that has ever been devised, and is, I believe, largely responsible for their notable success.

Discussion

Dr. Thomas G. Peacock (Southern Pines): Dr. Taylor has given us a very good paper, and I agree with him that Alcoholics Anonymous is doing honest, sincere work in helping these patients. In one point they go a little bit further than I have ever gone: Since I know that it is useless to ask an alcoholic to promise to stop drinking forever, I try to get him to say "I'm not going to take a drink until the Fourth of July," or Easter, or Christmas. Alcoholics Anonymous believes that "Sufficient unto the day is the evil thereof," and they ask their members to promise: "I'm not going to take a drink **today**." They are doing an excellent job and are accomplishing something.

I think perhaps dilantin or phenobarbital may be a helpful adjunct in the treatment of alcoholic patients—provided, of course, it is not given often enough to produce addiction.

Dr. Taylor: I follow very closely Dr. Strecker's viewpoint. Dr. Strecker will decline absolutely to accept any alcoholic who wants to be taught to drink like a gentleman. Dr. Strecker believes that that possibility for the real alcoholic personality is practically non-existent. Incidentally, Alcoholics Anonymous feels the same way.

In his book **Alcohol—One Man's Meat** — which, from the standpoint of treatment, is the most important book on the subject I know of—Dr. Strecker says that the place to treat alcoholism, medically, is in the doctor's office. The institution is a first-aid measure absolutely necessary to protect the alcoholic from himself and to protect society from him. But it is ridiculous to think we can persuade the alcoholic not to drink for the rest of his life while he's locked up where he **can't** drink.

Science and scientific methods which can provide useful and comforting things such as freedom from infection, good nutrition, alleviation of pain, and prolongation of life, cannot control fear, or shame, or grief; cannot establish purpose or dedication either for well or suffering human beings; cannot instil faith, hope, love, equanimity, or the other values that make life worth living.—David P. Barr: The Responsibilities of the Internist, Ann. Int. Med. 27:199 (Aug.) 1947.

LABORATORY SERVICES FOR THE PRIVATE PRACTITIONER

FRANK HOWARD RICHARDSON, M. D., F.A.C.P., F.A.A.P.

BLACK MOUNTAIN

What is the duty of the private practitioner with regard to having routine laboratory work done on his patients? It goes without saying that any good doctor will have all necessary laboratory tests made on any patient in whom he believes they are indicated. But what about the occasional patient with no obvious signs of trouble who has an early disease which would be detected in the course of a series of routine laboratory examinations? Any physician who is honest with himself can recall cases of early diabetes, beginning nephritis, helminthiasis, blood dyscrasia, or latent tuberculosis, which a urinalysis, stool examination, complete blood count, or tuberculin test would have brought to light. In such cases a routine laboratory procedure would save the physician's face and might save the patient's life.

It does not solve the problem to insist that every doctor should have his own compact little laboratory in which he can perform all the routine laboratory tests. The fact remains that not every practitioner can, or will, do this; and it is by no means certain that every man should attempt such a gigantic task. The "sink test" for urine is one of the miserable results of an insistence upon such a solution.

Two Methods of Providing Laboratory Services

I would like to suggest two possible solutions to this problem. The first is one that any man can adopt at once. The second—which is perhaps the ideal solution—requires a little more organization and initiative. Suppose we consider the simpler one first.

Arrangement between an individual practitioner and a technician or laboratory director

In order to put this plan into operation, the physician gets in touch with some laboratory technician who is already running a laboratory, or, preferably, with an internist who maintains his own laboratory but also does work for other doctors on a commercial basis. The latter arrangement is more satisfactory, since the internist stands respons-

ible for the character and dependability of all the work done by his technician, and he is likely to pick up points that might elude not only the technician, but the referring physician himself. He can also make available other procedures, such as basal metabolism tests, electrocardiograms, and the more unusual laboratory examinations beyond the scope of an ordinary technician. Frequently he can suggest helpful tests that would never occur either to a technician or to the referring physician.

The laboratory director or technician furnishes the referring physician a list giving the current price of each of the tests he is equipped to do—that is, the fee which the commercial laboratories and the hospitals charge the patient. Then, by consulting his records, he finds out what percentage of the bills sent out to his own patients is actually collected, and agrees to do all the work sent to him by the referring physician for a slightly higher percentage of the standard fees. It would be understood, of course, that the referring physician would pay on this basis for *all* the work he sent in, whether he actually collected from the patient or not.

How do the chief actors in the drama come out? The laboratory director increases the volume of his work, at a shade better than his usual percentage of collection. The referring doctor bills those of his patients who can afford to pay, at the prevailing rate. The difference between this fee and the reduced rate at which he pays the laboratory for the work more than accounts for the work done on charity patients, and for his failures to collect. Such at least seems to be the experience of those who try this plan. In addition, of course, his diagnostic accuracy is improved by having *all* his patients, and not merely a small selected group of them, given a full battery of tests. The advantages to the patient are, of course, obvious.

Division of the costs of a laboratory service among several participating doctors

The second plan proposed at the beginning of this discussion is a little more intricate at first glance; but it is so much more satisfactory that it is well worth exploring at some length.

In this case, an internist with his own laboratory or a commercial laboratory director offers to supply unlimited laboratory service to all the physicians who join in the plan. He furnishes each participating doctor with a schedule of fees comparable to those current in his locality. At the end of the month he totals the expenses involved in furnishing laboratory services to the participating doctors, and prorates the cost among all the participants according to the amount of work they have sent in. Each doctor collects the standard laboratory fees from his own patients, and the difference between these fees and the actual cost which he pays the laboratory is sufficient to take care of charity patients and failures to collect.

Recently considerable criticism has been directed at some laboratories of this type for the exorbitant fees charged the patient, a large part of these fees being retained by the referring doctor. This practice has been considered analogous to the rebates given eye specialists by some optical companies. While the laboratory director should charge the participating doctors enough to allow himself a reasonable recompense for his own services, and while the referring doctor must charge his patients enough to cover his own liability for cases in which he cannot collect, neither should attempt to profiteer at the expense of the patient.

Conclusion

These two plans are offered rather as targets for others to shoot at than as complete and perfect solutions of the problem posed at the outset. If any readers of the JOURNAL have a solution of the problem that is more practical, won't they let the rest of us in on their secret?

Obstacles to the practice of psychosomatic medicine.—We who have received our training in the past have had our attention focused upon the recognition and treatment of organic and mechanical abnormalities. We have been obsessed with the fear of missing the presence of serious or potentially serious anatomical or chemical disease. Intellectually we have been occupied with the relationship of the clinical signs and anatomical deviations, with the correction of chemical defects and with the search and application of specifics. We have become burdened with a time-consuming and elaborate ritual to accomplish these purposes. While all of this is praiseworthy it is not enough if in the process we have lost the listening ear and our contacts with patients as people, or if we attempt to make diagnoses and decisions without consideration of personal problems, interpersonal relationships, and life situations in family, occupation and community.—David P. Barr: The Responsibilities of the Internist, Ann. Int. Med. 27:201 (Aug.) 1947.

Maternal Welfare Section*

CASE REPORTS FROM THE RECORDS OF THE MATERNAL WELFARE COMMITTEE

Inaccurate Death Certificates

The laws of our state require completion of a death certificate prior to burial or disposal of a body. The certificate must state the cause of death, and in cases of doubt an investigation must be made by the local coroner or health officer. The principal purpose of these regulations is to disclose any irregularity associated with the death, particularly in cases where homicide must be considered as a possible cause. The reason for these regulations is sound, and each of us must be in sympathy with them.

The State Board of Health is required to collect vital statistics on all deaths occurring in the state. The Division of Vital Statistics of the State Board of Health must make periodic reports of all deaths which occur, giving an analysis of the causes of death. This information is used freely in both lay and medical publications. The maternal and infant mortality rates are prominent in these reports, and are often used as an index to the quality of medical care available in any given area.

The maternal mortality survey has demonstrated an important problem in relation to death certificates. In the case of a death which occurs when the patient is unattended, the coroner often confers with an available physician and assigns a plausible cause for the patient's death, without ordering an autopsy or obtaining any direct evidence of the actual cause of death. An additional problem is the tendency of the attending physician to assign a definite cause of death in doubtful cases, in order to facilitate the disposal of the body for the family concerned.

Inaccurate death certificates have occurred with such frequency in the experience of the Maternal Welfare Committee that they color the reports of our Bureau of Vital Statistics.

It is important for all physicians to make a concerted effort to correct this problem, since it affects the country's opinion of the quality of medical care in North Carolina.

Case 1—N. C. M. W. C. 300

A white married woman, 24 years of age, was attended during her pregnancy by an obstetrician. There was no history of any serious illness, and no abnormalities were recorded on any of thirteen prenatal examinations. Her blood pressure ranged from 110 systolic, 60 diastolic to 134 systolic, 86 diastolic. No albumin was found in the urine on any occasion. The Kahn test was negative. In the sixth month of her pregnancy, the patient had a mild convulsion at home, and was sent to the hospital immediately. The blood pressure was normal and urinalysis revealed no abnormality. A second short, mild convulsion occurred during the eighth month of pregnancy. All findings were again within normal limits.

A normal sixteen-hour labor was completed by low forceps delivery with episiotomy and repair. A normal living child was delivered. The patient's puerperium was entirely normal, and she left the hospital on the seventh postpartum day.

The patient was seen for a regular check-up six weeks after delivery. Her weight was 122 pounds and her blood pressure 130 systolic, 86 diastolic. A urinalysis revealed no abnormality. The pelvis was in excellent condition, with complete involution of the pelvic organs. Forty-eight hours later, the patient's husband found her lying on the bed with marked cyanosis. She was not breathing and was pronounced dead when an ambulance arrived.

An autopsy was performed by the coroner and disclosed only slight atherosclerosis of the aorta. For lack of positive information, the death was attributed to coronary thrombosis due to cardiovascular disease.

Discussion

All deaths occurring during the early weeks of the puerperium are considered maternal deaths unless they are clearly unrelated to the patient's pregnancy. Although pregnancy and the two epileptiform seizures during the prenatal period probably had no direct relation to the patient's death, it is the opinion of the Committee that the cause of death should be filed as undetermined under these circumstances.

Case 2—N. C. M. W. C. 234

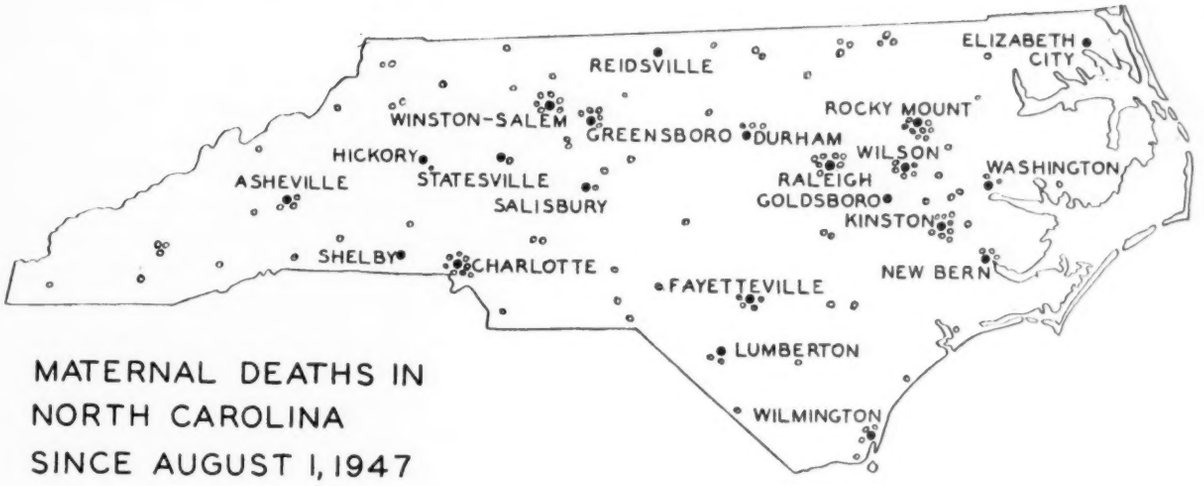
A married colored woman, 31 years of age, first consulted a physician in the seventh month of her third pregnancy. She was carefully examined, and her condition found to be normal. Her blood pressure was 120 systolic, 70 diastolic. Urinalisis showed no abnormalities, and the Kahn test was negative. She made two further visits for prenatal examinations, and the findings were normal on each occasion.

When labor began, the patient delayed in calling a physician. After sixteen hours, a physician was called and found the patient in active labor with a transverse presentation and the baby's arm protruding through the cervix. The cervix was fully dilated, and he referred her to a hospital for delivery.

A careful examination of the patient was made

*Prepared by the Maternal Welfare Committee of the Medical Society of the State of North Carolina:

Frank R. Lock, M.D., Chairman
J. Street Brewer, M.D.
G. M. Cooper, M.D.
E. W. Franklin, M.D.
J. S. Hunt, M.D.
T. L. Lee, M.D.
Ivan Procter, M.D.
R. A. Ross, M.D.
R. A. White, M.D.



upon her admission to the hospital. Her general condition was excellent; the blood pressure was normal, and no edema was present. The fetal heart could not be heard, and maceration of the skin of the presenting arm indicated that the fetus was dead.

The patient was given an ether anesthetic by an experienced anesthetist, and the attendant delivered a stillborn baby by internal podalic version and extraction. The obstetric operation was completed without difficulty. No unusual external vaginal bleeding occurred, and no vaginal lacerations were observed. The third stage of labor was not complicated, and the placenta was expressed without difficulty.

The patient reacted from the anesthetic sufficiently to inquire if the baby was living. She then began to complain of severe pain in the left side of her chest; profound shock rapidly developed, and the patient died one hour after delivery in spite of the administration of intravenous plasma and stimulants. No autopsy was obtained. The attending physician listed the cause of death as pulmonary embolism, upon the basis of the clinical picture of rapid death associated with pain in the left side of the chest.

Discussion

With the advantage of hindsight, the Committee reviewed the record and considered the probable causes of the patient's death. It was recognized by the Committee that the lower segment of the uterus becomes extremely thin during normal labor. In the presence of an impacted labor of sixteen hours' duration, this segment is frequently less than 1 mm. in thickness, and spontaneous rupture of the uterus is often imminent. The prolapse of the arm would also tend to increase the usual thinning of the lower uterine segment.

Rupture of the uterus often occurs when internal podalic version is performed under these circumstances. Profuse bleeding into the abdominal cavity may be present with little or no external vaginal bleeding. Embryotomy is a useful and accepted method of solving the problem presented by this case.

The Committee was of the opinion that the pain in the patient's chest probably resulted from blood in the peritoneal cavity and under the diaphragm. This analysis was presented to the physician who attended the patient as a more likely cause of her death than pulmonary embolism.

It is most gratifying to the Committee that they have since heard from this physician. He expressed appreciation of the Committee's analysis and stated that it had been helpful to him in a similar case which he had since observed.

Pulmonary embolism is a diagnosis commonly assigned in cases of sudden or unexpected death. Often it is given as the cause of death because evidence for a definite diagnosis is lacking. A careful review of the patient's final illness usually leads to several possible diagnoses and, at times, to constructive information for the management of a similar problem.

The family doctor as father confessor.—In the busy world of today the wear and tear of daily living is producing stresses and strains on many people who seek medical advice. The family physician is the father confessor of people with weary souls and troubled minds, who ofttimes are discouraged with the turn of events from day to day. The double role of the physician today as the family doctor and the father confessor places him in a unique position for social influence. Historically the father of medicine, Hippocrates, was the priest physician; whereas in modern times the dramatic events of the laboratory and the amphitheater draw attention to the material accomplishments, the greater field of medical service falls into the realm of the emotions and ambitions of those whom the doctor serves.—Edward L. Bortz: Medical Statesmanship, M. Ann. District of Columbia, 16:654 (Dec.) 1947.

CHAPTERS IN THE HISTORY OF THORACIC SURGERY

JOSIAH C. TRENT, M.D., F.A.C.S., *Editor*

DURHAM

II

THE WORK OF THE EMPYEMA COMMISSION IN WORLD WAR I*

In the winter of 1917-18 the army camps in the United States were ravaged by a severe epidemic of hemolytic streptococcal infection of the lungs, which was accompanied by a high incidence of empyema. During the latter part of 1917 this streptococcal interstitial bronchopneumonia was causing about 65 per cent of all deaths in the army in the United States. In order that the disease might be studied more adequately, a special pneumonia commission was sent by the Surgeon General to Texas in February, 1918. In March, 1918, another special commission, known as the Empyema Commission, was sent to Camp Lee, Virginia, to discover what could be done to check the high mortality of this complication. The head of this latter commission was Lieut. Col. Edward K. Dunham, who in civil life had been a bacteriologist of prominence. Originally the Commission consisted only of him and myself. It was gradually enlarged until finally it consisted of twenty-two members, who studied the bacteriologic, surgical, and nutritional aspects of the problem.

In general the condition was characterized by a large pleural exudate which occurred early in the course of the pneumonia and consisted of serohemorrhagic, fibrinous fluid containing many streptococci and a small number of leukocytes and red cells. Such cases were wrongly diagnosed as empyema, because the medical officers failed to realize that a true empyema is a collection of pus which is easily recognized as such by the naked eye. The pleural effusion which occurred early in the course of the streptococcal pneumonia was not pus in the usual sense.

This difference in conception was not merely of academic interest, but was of very great practical importance. Most cases of empyema which had been encountered by the same medical officers in civilian practice had been discovered after the subsidence of pneumonia. When an aspirating needle had been inserted into the pleural cavity, thick, creamy pus had been withdrawn. Open drainage, generally by rib resection, had been followed usually by prompt recovery. Those cases were due to infection by a pneumococcus. They were true examples of empyema (collections of pus). In other words, they were fully developed abscesses. The patients in the army epidemic, on the other hand, were found, early in the course of streptococcal bronchopneumonia, to have pleural fluid containing only microscopic pus. When the same principles of treatment were applied, approximately half the patients died.

It became evident to the members of the Empyema Commission that many of the deaths in those cases in which early open drainage had been instituted were due to asphyxia. Some of the patients were operated on at a time when they were suffering from severe air hunger. They were cyanotic and orthopneic. The additional burden to their respiration caused by creating an open pneumothorax from the open sucking drainage wound was often sufficient to cause death. Sometimes death occurred while the patient was still on the operating table, or an hour or so later.

When the plan of treatment was changed by postponing the drainage operation until after the pleural exudate had become a creamy pus, there was a dramatic reduction in mortality. At Camp Lee, for example, the mortality dropped suddenly from slightly more than 40 per cent to 4.3 per cent.

It seemed, therefore, that probably one of the most important factors in the previous high mortality was the induction of an open pneumothorax at a time when the patient could not withstand such an additional burden to his impaired respiration. During the period of waiting, which was generally about ten days or two weeks, the pneumonia usually subsided and the patient's general condition improved greatly. The drainage operation was performed in the post-pneumonic phase of the disease, and it was truly an abscess that was drained. The condition was therefore converted into one which was very similar to the well-known benign post-pneumonic pneumococcal empyema which

* From the Department of Surgery, Washington University School of Medicine, St. Louis, Missouri.

was successfully treated by open drainage in civilian practice.

There were many who doubted the importance of the factor of open pneumothorax. The general impression at that time, because x-ray examinations of the chest were very crude, was that the effects of an open pneumothorax were confined to the side of the chest on which the opening was present. The mediastinum was regarded as constituting a rigid partition between the two halves of the thorax. If that conception were true, then indeed the creation of an open pneumothorax would affect only one lung. Because of the lack of precise information about the effects of an open pneumothorax, R. D. Bell and I were detached from the Commission and sent to the Johns Hopkins Medical School for two months to make an experimental study of the problem. It seemed probable also that such a study might have a bearing on the whole question of the performance of intrathoracic surgical operations. Chest surgery at the time was confined almost exclusively to the removal of some contained missiles within the lung.

The experimental study yielded much valuable information on the dynamics of respiration and on the effects of disturbing the intrathoracic pressure relationships. Limitations of space will not permit much discussion of our findings. Briefly, however, it can be stated that an open pneumothorax on one side was found to exert effects on both lungs, but not to the same degree. The normal mediastinal partition therefore is not an efficient barrier to the transference of pressure from one pleural cavity to the other.

The question of how large an opening in one side of the chest can be withstood is determined very largely by the vital capacity of the individual. A patient with a high vital capacity can compensate for a much larger opening than one with a low vital capacity. Indeed, if the vital capacity is scarcely larger than the tidal air requirement, the patient will die of asphyxia if only a tiny opening is made. On the other hand, a patient with a good vital capacity can withstand a bilateral open pneumothorax if the openings are not too large.

These observations not only did much to clarify the confused ideas about the effects of open pneumothorax, but they also provided a rational basis for postponing a drainage operation for empyema until the exudate becomes frank pus. When this occurs, a true abscess is present, walled off from the rest of the pleural cavity, and the vital capacity is higher because the pneumonic process has subsided. Thus any pressure disturbances which may occur will be minimal.

Three principles of treatment for acute empyema were recommended by the Empyema Commission, which eventually were internationally accepted. These were: (1) drainage, but with the careful avoidance of an open pneumothorax during the period of active pneumonia; (2) early sterilization and obliteration of the cavity; (3) maintenance of the patient's nutrition. Of the three principles, the first one was considered to be by far the most important.

These principles have lost some of their practical value in the last few years since the introduction of the new antibiotic drugs. Empyema, the once common complication of pneumonia, recognized since the time of Hippocrates 2300 years ago, has become nearly obsolete because of penicillin.

EVARTS A. GRAHAM, M.D.
Professor of Surgery,
Washington University
School of Medicine

The physical changes accompanying emotion.—The classical studies of Harold Wolff and his associates have shown that embarrassment or resentment may cause in the stomach a flushing, a hyperemia and at the same time an increase in secretion of acid; that when these emotions are continuous or often repeated, erosions of the mucosa may occur and that finally actual ulcerations may develop with symptoms indistinguishable from peptic ulcer. Of equal significance were their observations that in the same individual, fear and dread may be accompanied by abnormal pallor of the gastric mucosa with diminution or temporarily complete absence of gastric secretion and with loss of appetite and disgust for food. Similar changes have been seen in the nasal mucous membrane where resentment and embarrassment may produce hyperemia and excessive secretion while fear results in pallor and drying of secretions.

These observations must be regarded as only preliminary and there is little reason to suppose that the responses to emotion of other tissues and organs are less significant. Much evidence is already at hand to indicate that such diverse conditions as asthma, hypertension, thyrotoxicosis, ulcerative colitis and glaucoma have as a part of the symptom complex an emotional component which is significant both etiologically and symptomatically.—David P. Barr: The Responsibilities of the Internist, Ann. Int. Med. 27:198 (Aug.) 1947.

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NIGHT CALLS

In his "Secretary's Letter" for February 16, Dr. George Lull, secretary of the American Medical Association, tells an unpleasant truth when he says that

"Patients all over the country are voicing bitter criticism of the medical profession because of their inability to obtain the services of a physician at night. Scores of letters are being received at A.M.A. headquarters each week from patients who complain that doctors decline to make night calls. . .

"At the National Conference on Medical Service, held in Chicago, February 8, someone told the audience that a state legislator whose child was seriously ill called five doctors and got five turn downs.

"These complaints, piling up at an alarming rate, present a grave problem. Every doctor knows that a hasty turn down of a phone call at night creates ill feeling toward the medcal profession as a whole."

Every physician who has been in practice for any length of time knows the nightmarish sensation of being jerked from a sound slumber in the wee small hours by the ringing of the telephone bell. He knows the immediate impulse to refuse to leave his good warm bed. He should learn, however, not to obey this impulse without inquiring about the symptoms of the patient. If he is convinced that the call is necessary, he must force his tired muscles into activity.

The time has been when it was taken for granted that any doctor would answer every call he received, unless he was sure that it was unnecessary. Apparently this situation no longer prevails, if we may judge not only from Dr. Lull's letter but from other sources nearer home. Not long ago a young doctor just out of service came to a North Carolina city to do general practice. A number of older doctors were glad to refer to him calls that they could not make themselves, and his practice grew apace. Within six weeks after he had opened his offices, a medical veteran who had been giving him one to three referrals a day received a call about 2 a.m. from one of his old patients. After promising to send someone or to go himself, he called the young man, who came to the telephone, yawning audibly, and said, "O Doctor, I was out last night and am so tired that I wish you would get somebody else." The older doctor got up and made the call himself. Early next morning he phoned his secretary not to give the young man another call.

This doctor did not know that the family whose acquaintance he might have made was one of a closely-knit community of relatives, all most desirable patients. They would have been the nucleus of a good practice—but the young man was so exhausted by his first six weeks as a civilian doctor that he exchanged this golden opportunity for an hour's sleep.

Many doctors have added good families to their lists by making night calls; and, by the same token, many doctors have lost desirable families by refusing to make calls at inconvenient hours.

The artificial shortage of doctors brought about by the war will not last forever; and as competition becomes keener, patients will again be free to choose their doctors.

The medical profession still has a great reservoir of good will; but it is possible to lose much of the public's approval through real or apparent indifference to human suffering. The real doctor, in the words of

the late J. C. da Costa, "must learn thorough self-surrender and all his life must wear the iron yoke of duty." Consideration of the patient, as shown by willingness to make night calls when necessary, not only helps to build up the individual doctor's reputation, but is the best sort of public relations for the whole medical profession.

* * * *

ADEQUATE HOSPITAL SERVICES TO ALL THE PEOPLE

An unusually sane and logical discussion of the future course of hospital construction in this country is to be found in the memorandum of a conference between James F. O'Neil, national commander of the American Legion, and Graham L. Davis, president of the American Hospital Association.

The American Legion is advocating a federal hospital system of 300,000 beds for veterans unable to pay for hospital service and with service-connected disabilities. The American Hospital Association, like the American Medical Association, "is not in favor of federal governmental control of hospitals; nor does it believe in the principle of the care of the population in the governmental charity hospital." Furthermore, as Mr. Davis points out, "300,000 beds is far in excess of the needs of all veterans . . . What will happen 15 or 20 years from now, if not sooner, with the hospital construction program under Public Law 725 (the Hill-Burton Bill) and the veteran hospital construction program nearing completion, is that the nation will have 300,000 more beds than it needs.". The resulting chaotic situation would be "just what the Communists want."

Mr. Davis reminded Mr. O'Neil that all the national health, labor, farm and business organizations supported the Hill-Burton Hospital Survey and Construction Act, the purpose of which is "to assist the several states . . . to inventory their existing hospitals . . . and to develop programs . . . for furnishing adequate hospital . . . services to all their people." This act has as one of its aims "to get doctors and nurses in the rural areas by providing them with adequate facilities." The veteran hospital program, on the other hand, provides for a few large hospitals to be located in medical centers, preferably near medical schools.

The decision to locate a large neuropsychiatric hospital at Salisbury—40 miles from the Bowman Gray School of Medicine of Wake Forest College—makes it seem doubtful that this policy will be strictly adhered to when it conflicts with political expediency. Whether the huge V.A. hospitals are located in large cities or in small towns, however, both the veterans and the population as a whole stand to lose more than they gain. If the hospitals are located in cities, they will be in competition with civilian hospitals, and will make it difficult for the latter to secure adequate personnel. If smaller communities are chosen for the oversized V.A. hospitals that are being planned, most of the veterans who seek hospital care will have to leave their families and travel long distances in order to get it. Furthermore, small communities do not afford the wealth of medical personnel that can be found in the large cities. The hospital care of veterans will be made unnecessarily expensive, both by the distances the patients will have to travel and by the greater financial inducements that must be offered the professional staffs of these hospitals.

Dr. Louis Bauer has pointed out that, while government hospitals have 78 per cent of the total bed capacity of our nation, they account for only 39 per cent of the admissions; non-government hospitals, with 22 per cent of the beds, care for 61 per cent of the patients. The following case history throws some light on the reason for this startling discrepancy:

A veteran came to a private practitioner for advice about a gastrointestinal condition. When told that an x-ray examination was necessary to determine the cause of his symptoms, he replied that he had been x-rayed at a veterans' hospital in this state. In reply to a request for a report on the findings obtained at this hospital, the medical officer in charge wrote that he had had part of the gastrointestinal tract x-rayed, but that the patient had left before the examinations had been completed. When the patient was asked why he had not stayed to have the rest of the x-rays made, he replied, "Why, doctor, I had been there a month, and got tired waiting." Since the work he had had done at the government hospital in a month could easily have been completed in two to three days, the physician could not

blame him for becoming disgusted.

The doctor later was told by one who should know that it was a frequent custom to keep patients in a V.A. hospital by dragging out their laboratory procedures. Since the hospitals receive their allotments of tax money on the basis of patient days, they are kept as full as possible during slack times by prolonging the stay of their patients.

Physicians who have talked with veterans about the treatment they have received in V.A. hospitals know that the experience related above is not an uncommon one. If the proposal to expand the federal hospital system to 300,000 beds is passed by Congress, the enormous waste represented by such incidents will be increased to alarming proportions. In the interest of the veterans who would receive this type of treatment, as well as of the taxpayers who would pay for it, every doctor should back the American Hospital Association in its support of the Hill-Burton act and its opposition to the hospital construction program proposed by the American Legion.

* * * *

ONE DOCTOR FOR 10,678 PATIENTS

It is gratifying to know that the physicians of Great Britain have voted by an overwhelming majority to retain their freedom instead of becoming paid government employees. In a plebiscite conducted by the British Medical Association, 86 per cent—24,340 to 4,084—voted against accepting the National Health Service Act (the British version of the Wagner-Murray-Dingell bill), and 85 per cent—24,066 to 4,495—said they would not enter the service if the majority voted against it. A little calculation shows that, with 4,495 physicians to care for about 47,000,000 people, each doctor would have to be responsible for nearly 11,000 patients.

Although the scheme is called "universal free medical service," few are naive enough to believe that any service furnished by the government is, in the final analysis, free. The people will have to pay for it in taxes—and it has been shown over and over that government agencies are notoriously extravagant and inefficient as compared with private concerns.

It is ridiculous, of course, to assume that anything approaching adequate medical care could be furnished by such a disproportionately small number of physicians. There are only two alternatives apparent, however. One is to abolish the Act; the other is for the great majority of British citizens to pay twice for their medical care—once when they pay for the National Health Service Act in taxes, and again when they pay for treatment by private physicians who remain outside the provisions of the Act.

A letter from Dr. J. C. Watts in the *British Medical Journal* for February 14 recounts that, following the introduction of the National Health Service in Scotland in 1865, Joseph Lister was excluded from the government employment because "the Minister of Health had been fully informed . . . that the use of carbolic acid, since it prevented the formation of laudable pus, was inimical to the patient. . . The Minister of Health then rose to say that he was proposing to introduce regulations making the use of carbolic acid and similar substances, loosely described by Mr. Lister as 'antiseptics' (whatever that might mean), illegal."

Is it too far fetched to wonder what the result might be if Mr. Bevan developed a prejudice against penicillin or other antibiotics? In the United States, the mass immunization of our armed forces came within a hair's breadth of being forbidden because a high-ranking officer had a severe reaction to a dose of tetanus toxoid.

Another letter in the same issue, from D. W. Winnicott, calls attention to the "danger that a whole-time State medical service could be forced by Parliament to accept osteopathy, homeopathy, and other practices not accepted by the profession." That this danger is not confined to the other side of the Atlantic is shown by a release from the Veterans Administration, dated February 9, which quotes Dr. Paul B. Magnuson, chief medical director, as saying:

> "Within the limits of practice of the healing art imposed by their respective state licenses, osteopathic physicians, when their services are requested by veterans, may be designated to provide outpatient treatment, on a fee basis, for service-connected disabilities under the same rules and regulations as govern such services by doctors of medicine."

Let us hope that British doctors may be successful in their goal-line stand against the forces of totalitarianism; and let us maintain a vigilant watch lest American medicine find itself in the same uncomfortable position.

Clinicopathologic Conference

BOWMAN GRAY SCHOOL OF MEDICINE OF WAKE FOREST COLLEGE

The patient was a 59-year-old white carpenter who entered the hospital on July 31, 1947. His chief complaints were high fever for three months, and weakness for two and a half months. About three months before entry he had a cold with a slight cough productive of a small amount of whitish, mucoid material. He also noted soreness in his "bronchial tubes." These symptoms continued, and about two weeks later he noted a gradual onset of fever. At first his temperature would rise only to 100 F., but later it rose as high as 102 to 104 F. daily. These elevations of temperature were often accompanied by a hard shaking chill with profuse sweating. The chills did not come on at any definite time of day. They would often occur every two or three days, but occasionally would not appear for several days.

Four weeks after the onset of his illness the patient entered another hospital for study. Blood cultures were negative, as were agglutination tests for typhoid, paratyphoid, brucella, and tularemia. Blood smears were negative for amebae, ova, and parasites. It was noted that the right leaf of the diaphragm was elevated and moved very little on respiration. A needle aspiration of the liver was performed, but no pus was found. During his hospital stay the patient began to have vague abdominal pain, with tenderness at McBurney's point. An appendectomy was performed, and a "low-grade peritonitis" was found. There was some brownish fluid in the peritoneal cavity.

The patient appeared to improve considerably after the operation, and his fever subsided. After he returned home, however, the temperature again rose to 105 F. He had been given unknown amounts of penicillin, sulfonamides, and streptomycin, as well as quinine and Diodoquin without benefit. His weakness gradually progressed, and he was referred to the North Carolina Baptist Hospital for further study.

The patient had had typhoid fever twenty years previously. He lived in a malaria-infested country, but had not had malaria. He had never had diarrhea. There was no history of contact with a tuberculous patient. He used city water, but had an outhouse which was downhill from his home, and drained into a creek. The milk he drank was raw and came from his own cows, which had all been tested for Bang's disease.

Physical examination showed the temperature to be 102 F., the pulse 120, respirations 24, and blood pressure 100 systolic, 60 diastolic. On admission he weighed 143 pounds, but after one week in the hospital his weight was recorded at 131 pounds; his highest weight several years previously had been 165 pounds. The patient was a fairly well developed, poorly nourished male who appeared chronically ill. The skin was warm, moist, and pale; no petechiae were noted. The pupils reacted normally, and the fundi were normal. All teeth were missing. The tongue was slightly red and smooth about the edges. The trachea was deviated to the right, and there was slight emphysema of the chest. At the right lung base posteriorly the breath sounds were diminished, fremitus and whispered voice sounds slightly increased; dry rales were audible at the left base on inspiration. The heart was not enlarged to percussion; the heart sounds were distant, the rhythm regular; there was a soft systolic murmur over the precordium, loudest at the apex. The abdomen showed a well healed right rectus incision. Lateral to the incision there was an area approximately 10 cm. in diameter which was moderately tender. An indefinite mass which was smooth and non-tender extended 4 cm. below the right costal margin; it was thought that this was liver or perhaps muscle spasm. The spleen was not felt, and there was no abdominal fluid. The genitalia were normal. Rectal and neurologic examinations were not remarkable.

The urine was essentially normal. The blood count on admission showed 8.5 Gm. of hemoglobin, 2,820,000 red blood cells, and 8,000 white blood cells with 58 per cent polymorphonuclears, 25 per cent nonsegmented polymorphonuclears, 8 per cent small lymphocytes, 6 per cent monocytes, and 3 per cent unclassified cells. Platelets appeared adequate. Smears for malaria did not reveal parasites. Total serum proteins were 7.1 Gm. per 100 cc., with 3.6 Gm. of albumin and 3.5 Gm. of globulin. A Kahn test and stool examinations were negative. A bromsulfalein test showed 15 per cent retention in

thirty minutes. Agglutinations for typhoid, brucella, and tularemia were all negative, as was a hetrophil agglutination test. A urine culture and nine blood cultures were negative. A complement fixation test for amebiasis was negative. A tuberculin test using old tuberculin in a 1:10,000 dilution was negative on August 3.

The electrocardiogram was normal. An x-ray of the chest showed the heart and lungs essentially normal; there was a band-like density in the left base, and the left pleura showed evidence of calcification in its lower portion. This finding probably represented an old pleuritis with calcification. A barium enema examination and x-rays of the esophagus and stomach were negative. The fact that the second and third portions of the duodenum were never visualized at fluoroscopy suggested the possibility of some pressure from the extrinsic mass in the right upper abdomen; the right diaphragm was elevated and moved only slightly. X-ray examination of the liver and spleen following injection of Thorotrast showed homogeneous concentration of the dye in these organs without evidence of filling defect.

During the first two weeks of the patient's hospital stay the temperature varied between 104 and 98 F., the pulse between 80 and 120, and the respirations between 20 and 40. Beginning August 7, he was given intramuscular injections of emetine hydrochloride, 32 mg. twice daily for ten days, because of the possibility of an amebic abscess of the liver. There was no response to this therapy.

On August 16 he was transferred from the medical to the surgical service for an exploratory laparotomy. After 800,000 units of penicillin were given daily for three days with no change in the temperature curve, an operation was performed on August 21. An incision was made over the twelfth rib; extraperitoneal exploration of the space surrounding the liver posterolaterally did not reveal any inflammatory reaction. In the upper lateral portion of the liver was found a rather hard nodule about 1.5 cm. in size. Further exploration revealed a hard white plaque on the peritoneal surface covering the kidney. The pathologic diagnosis on "frozen section" was chronic inflammatory tissue. Deeper digital exploration revealed many hard lymph nodes of various sizes in the mesentery and retroperitoneal space. The gallbladder was identified and felt to be apparently normal. A specimen of the liver nodule was taken and sent to the laboratory for biopsy.

On August 25, 1947, streptomycin was started in doses of 3 Gm. daily. The temperature was 100 F. on August 27, and thereafter ranged between 98 and 99.4 F. daily.

The patient was transferred back to the medical service on September 1. Physical examination was essentially the same except that the patient felt well and did not appear chronically ill. On September 6, a skin test with purified protein derivative of tuberculin, first strength, was negative after forty-eight hours. On September 9, a test with the second strength purified protein derivative gave a 3-plus reaction in forty-eight hours. Another agglutination test for tularemia on September 5 was reported as being negative. The hippuric acid and galactose tolerance tests were within normal limits. The patient was continued on streptomycin, 3 Gm. daily, and his temperature ranged between 98 and 100.2 F. for the remainder of the hospital stay. When he was discharged on October 16, the patient felt well clinically and his weight was 145 pounds.

Discussion

DR. GEORGE T. HARRELL: In summary, this is the story of a severe febrile illness which involved the liver and responded to the therapeutic administration of streptomycin. The onset with symptoms suggesting an upper respiratory infection was followed by generalized symptoms and later by localization of the disease in the abdomen. Such a sequence of events could follow the dissemination of an infectious agent through the lymphatics or through the blood stream.

Typhoid fever is an example of a disease which enters through the lymphatics. Following ingestion, typhoid bacilli are phagocytized by the large mononuclear cells in Peyer's patches, whence they are carried through the intestinal mucosa into the lymphatics. As the organisms break out of the regional abdominal lymph nodes into the thoracic duct, they are carried by lymph into the subclavian vein and thence by the blood to the lungs, where they meet a large filter bed. The lodgment of small clumps of bacteria in

the lung capillaries may give symptoms suggesting an upper respiratory infection, and many cases of typhoid are diagnosed as bronchitis in the first few days. The infection then is widely disseminated by the blood stream, secondary localization occurring in the liver and biliary passages. In this case the gradual onset of fever, with steady progression to high temperature, chills, and sweating, is consistent with typhoid fever, but the subsequent course is not.

An organism which reached the body through the bowel, passing the intestinal mucosal barrier, but spreading directly through the blood stream without first invading the lymphatics, would enter the portal circulation and be filtered out in the liver. Amebae invade the body in this fashion. If such was the mode of spread in the present case, the symptoms of an upper respiratory infection must have been due to an intercurrent disease of no great significance.

Multiple *anatomic* structures were involved. The organ first proved to be affected was the appendix; a report of the pathologic findings in this organ might prove extremely informative. It is known that the peritoneum was involved, since a low-grade peritonitis was observed during the appendectomy; a peritoneal plaque presumed to be fibrotic was noted at the second exploration. The abdominal lymph nodes were seen to be enlarged: the results of a pathologic examination of a node would shed considerable light on the mode of spread of the infection. The liver was involved, as was proved at operation. The diaphragmatic portion of the right lobe of the liver, where the nodule was found, is the spot where amebic abscesses locate most frequently; aspiration before the first operation did not reveal an abscess, however. Since jaundice was not a clinical manifestation of the disease, the periportal or biliary radicals were not affected; had the central areas of the liver lobule been involved, ascites would have been a prominent finding. The x-rays suggest involvement of the lung, though the presence of calcification indicates that the lesion was of long standing and possibly inactive. The anatomic distribution of the lesions gives the impression of a widespread disease process with an apparent predilection for lymphatic tissue.

No definite *etiologic* agent was clearly demonstrated. To judge from the pathologic description of the peritoneal plaque, the patient had a chronic granuloma; this type of tissue response may be caused by many agents of disease.

One approach to an etiologic diagnosis is an analysis of the possible sources of infection. The patient's occupation (carpenter) would not predispose him to any particular type of infection. No history of direct contact with an animal reservoir—such as rats or rabbits—or with another infected individual is given. He is known to have been exposed to malaria in the past, but the clinical course of the disease is not that of malaria. Since his home was connected with a city water supply, which is presumed to be safe, the infection must not have been water-borne. Though he did not have the most modern facilities for sewage disposal, the fact that the privy was downhill from the house would make unlikely direct contamination of food or water with sewage. The most likely source of the infecting agent would be milk The patient kept his own cows, and the milk was not pasteurized before it was used.

Laboratory data are helpful in arriving at an etiologic diagnosis, if the findings are positive; negative findings should not be accorded the same weight. Unfortunately most of the diagnostic studies were negative. The blood cultures should have disclosed a blood-stream infection with the most common gram-positive or gram-negative bacteria. The clinical course is rather long and severe for the typhoid type of brucellosis, but tularemia of the typhoid type might produce exactly this clinical picture. Brucella might have been recovered if the cultures on ordinary media were kept for several weeks or if special media were used. The tularense organism would not be recovered from blood cultures unless a special medium containing cystine were used. The brucella or tularense agglutinations might have become positive during convalescence.

Tuberculosis is a disease which has a particular affinity for lymphoid tissue. The x-ray finding of an old pleuritis with calcification is compatible with an initial tuberculous lesion. Though the calcification would suggest that the lesion was well walled off, a reinfection type of tuberculosis could have followed a spread from this initial focus even though it had been dormant for years. A

reinfection may have occurred from the outside, following ingestion of contaminated milk. The negative tuberculin test early in the course of the illness is compatible with an infection of sufficient severity to overwhelm the immune processes; the development of a positive test after antibiotic therapy and during convalescence would make tuberculosis a distinct possibility.

The fact that the white blood cell count was always low would also tend to favor a tuberculous etiology; the shift to the left in the Schilling hemogram and the small number of small lymphocytes would be compatible with a tuberculous infection.

A fungus disease such as histoplasmosis might be considered, but the spleen was not sufficiently enlarged nor the white count low enough. A larger parasite, Endamoeba histolytica, may penetrate the bowel, frequently at the appendix, and spread to the liver through the portal circulation; the complement-fixation test was negative, however. The use of Thorotrast as a contrast medium in the diagnostic x-ray studies did not reveal a metastatic malignant process nor a diffuse failure of concentration as might occur in Hodgkin's disease, a granulomatus process of uncertain etiology.

An attempt may be made to arrive at an etiologic diagnosis by a trial on chemotherapy. This method of analysis presupposes that chemotherapeutic drugs are specific for restricted groups of infectious agents. This principle is not entirely true, but the therapeutic spectrum of a given drug is reasonably well known. Other variables—such as the dosage of the drug, the route of administration, and the duration and location of the pathologic process—all affect the therapeutic result.

The patient's failure to respond to quinine is reasonably good evidence that malaria was not the cause of the fever. Since quinine has an antipyretic effect and is a general protoplasmic poison, which affects other infectious agents as well as plasmodia, a good therapeutic response must be interpreted with caution. Diodoquin given by mouth gives good results in amebic dysentery or amebiasis confined to the colon; it is not absorbed sufficiently to have a good therapeutic effect on amebic hepatitis. Emetine given parenterally is the drug of choice in amebic hepatitis or early abscess of the liver; the failure of an adequate course of this drug would make amebic infection of the liver less likely. Emetine, too, may have a nonspecific temporary antipyretic effect.

This patient, before admission to this hospital, had had a course of sulfonamide therapy which, if adequate, should have controlled an infection with the usual gram-positive cocci or with some gram-negative cocci and bacilli. An unknown amount of penicillin was given before admission, and an adequate amount was administered preoperatively in this hospital, though for only three days. The failure of both courses of penicillin to alter the temperature or course of the disease would tend to rule out infection with sulfonamide-resistant gram-positive cocci, the gram-negative cocci, and the spirochetes. The course of therapy was too short to produce improvement of a tertiary syphilitic lesion, and it must be remembered that the blood serologic test may be negative at that stage of the disease.

Within three days after the administration of large doses of streptomycin was begun, the temperature fell to normal. It is true that streptomycin administered before admission was ineffective, but the daily dose and duration of therapy are not given. Such a prompt response to streptomycin would be expected in cases of infection due to most of the common gram-negative bacilli, but if any of these organisms were present, they should have been grown from the blood or liver with no difficulty. Tularemia responds rapidly to even small doses of streptomycin given for a short period of time; the clinical course and the location of the lesions are compatible with the typhoid type of tularemia, but the agglutination test, which should be positive after recovery, was negative. Brucellosis, histoplasmosis, and Hodgkin's disease have not been shown to respond to the administration of streptomycin.

Ordinarily, one would not expect streptomycin to exert a beneficial effect before the second week in a tuberculous infection. It is conceivable, however, that the initial course of the drug was sufficient to inhibit multiplication of bacilli without eradicating them. Sufficient inhibition may have been achieved to permit the large doses of streptomycin to be effective in a much shorter period of time than would otherwise be anticipated. The

fact that the tuberculin test became positive after therapy would lend additional support to the impression of a tuberculous etiology.

Recovery from tuberculosis of the liver is a relatively rare occurrence. Tubercles are frequently found in the liver in the course of miliary spread of the disease. Miliary tuberculosis was uniformly fatal before the advent of streptomycin; the effectiveness of the antibiotic in this type of infection is still under investigation[1]. In rare cases large, solitary tubercles have been reported as the cause of recurring fever with enlargement of the liver[2]. Large tuberculomas should have been outlined by the Thorotrast, and one would not expect them to respond so promptly to chemotherapy[3]. The absence of jaundice would tend to rule out retrograde infection along the small branches of the biliary tree—the so-called tubular tuberculosis of the liver[4]. The fact that laboratory studies showed no diminution in liver function would suggest that the lesions were small; the response to streptomycin would indicate that they were not fibrotic and that the antibiotic had readily penetrated into the tubercles.

Dr. Harrell's Diagnoses

I. Healed tuberculous pneumonitis and pleuritis.

2. Tuberculosis of the appendix with healed focal tuberculous peritonitis.

3. Tuberculous abdominal lymphadenitis.

4. Tuberculosis of the liver—multiple small fibrocaseous lesions in the midzonal area of the lobules.

Anatomic Discussion

DR. EARL R. BALDWIN, JR.: The tissue submitted for examination consisted of a small, grayish-white mass. Several nodular elevations 2 mm. in diameter were noted in cut sections. Microscopic examination showed a granulomatous reaction which practically destroyed the architecture of the liver. There were numerous areas of necrosis, each surrounded by a zone of round cells, Langhans' giant cells, and epithelioid cells. Beyond this zone there was active fibrous-tissue proliferation.

The pathologic picture is that seen in many of the infectious granulomas, and although it is impossible to make an etiologic diagnosis on the basis of the histologic picture alone, the response seen here is strongly suggestive of tuberculosis. No tubercle bacilli were demonstrated by doing acid-fast stains on serial sections of the tissue submitted.

Anatomic Diagnosis

Chronic granulomatous hepatitis, suggestive of tuberculosis

Follow-Up Note

The patient was transferred to the Western North Carolina Sanatorium on October 18, 1947. Streptomycin was continued, though the dose was reduced to 0.5 Gm. twice daily on October 28. On November 25 the drug was discontinued three months after therapy was started. He was discharged December 18 on limited activity.

About February 1, 1948, he noted afternoon fever and the onset of cough productive of a half cup of whitish sputum which was occasionally blood-flecked. By the time of his return visit to the North Carolina Baptist Hospital on February 16, he had lost 10 pounds in weight. An x-ray of the chest revealed old fibroid changes in the left lower lung field, but no evidence of tuberculosis. Acid-fast organisms of atypical shape were found in the sputum.

The diagnosis of tuberculosis seems even more likely in view of the latest findings. Drug-fast strains of organisms, which often are morphologically atypical, may develop in the course of chemotherapy.

The toxicity of streptomycin now appears to be sufficiently great to deny use of the drug to those patients who are making satisfactory progress under conventional forms of treatment. At present, most experienced physicians prefer to reserve the limited supply for patients more acutely ill, and especially for those in whom the disease has been progressive during recent months, and no other treatment is likely to be effective. Streptomycin is of no lasting or significant benefit to patients who apparently have hopeless, destructive types of pulmonary tuberculosis.—H. McLeod Riggins, M.D. and H. Corwin Hinshaw, M.D., Am. Rev. Tbc., Aug., 1947.

It is wise to assume that all subjects who show a positive tuberculin test before the age of three years have active infection. In such children, the infection has hardly had time to become inactive.—Joseph D. Wassersug, M.D., N.E. Jour. Med., July 3, 1947.

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1. (a) Wolf, G. A., Jr., and Flory, C. M.: Miliary Tuberculosis of the Liver, Am. Rev. Tuberc. 51:553-560 (June) 1945; (b) Randolph, B. M.: Acute Miliary Tuberculosis of the Liver, Am. Rev. Tuberc. 22:593-597 (Dec.) 1930.
2. Herrell, W. E. and Simpson, W. C.: Recurrent Hyperpyrexia Due to Solitary Tuberculoma of the Liver, J.A.M.A. 111:517-519 (Aug. 6)) 1938.
3. Ashton, N.: A Case of Multiple Tuberculomata of the Liver, J. Path. & Bact. 58:95-97 (Jan.) 1946.
4. Rosenkranz, K. and Howard, L. D.: Tubular Tuberculosis of the Liver, Arch. Path. 22:743-754 (Dec.) 1936.

MEDICOLEGAL ABSTRACT

J. F. OWEN, M.D., LL.B.

RALEIGH

INSURANCE: *A misrepresentation in an application for a policy will not make the policy void unless it is made with intent to deceive or unless it materially affects the acceptance of the risk by the insurer and contributes to the event on which the policy becomes payable.*

This is a case in which the father of a minor child secured for her benefit a policy covering hospital insurance. In answering the usual questions he failed to inform the company that the child had for some time suffered from hernia. Subsequent to the issuance of the policy the child had an attack of appendicitis and was taken to a hospital, where an operation was performed for this condition. During the operation the surgeon discovered the hernia and repaired it. He made no additional charge for this service. Because the insurance company failed to conform to its contractual obligations, this suit was instituted by the father and the child who was the beneficiary.

The insurance company alleged in its defense that the failure of the plaintiff to reveal the presence of the hernia was a deliberate attempt to deceive, and that this act on his part rendered the policy void because of fraud.

The issues submitted to the jury in superior court established the following facts: (1) that the policy was in force at the time of the operation; (2) that, though it was incorrectly stated in the application that the *feme* plaintiff did not have hernia, the statement was not made with intent to deceive; (3) that the hernia did not contribute to her hospitalization and did not materially affect acceptance of the risk by the defendant insurance company; and (4) that under the terms of the policy the plaintiffs were entitled to recover $145.00, the sum alleged to be due on the insurance contract.

From this judgment the defendant appealed to the Supreme Court.

The Supreme Court felt, and so stated, that the false answer was not made with intent to deceive, did not materially affect the acceptance of the risk, and did not contribute to the contingency or event on which the policy became due and payable. The child was sent to the hospital and operated upon primarily because of appendicitis. The hernia operation was in a sense purely incidental, and rendered the non-disclosure complained of by the insurance company immaterial. The judgment of the court below was affirmed.

(North Carolina Supreme Court, spring term, 1947. Vol. 227, p. 456.)

TUBERCULOSIS ABSTRACTS

A Review for Physicians

Issued Monthly by the National Tuberculosis Association

Vol. XXI March, 1948 No. 3

THE DIAGNOSIS of active pulmonary tuberculosis rests on three pillars—symptoms, roentgenology, and the finding of the tubercle bacillus. Of this triad the first two are not specific for the disease; X-ray shadows can only suggest the diagnosis, and symptoms may be vague or appear late in the disease. Physical signs and tuberculin tests have definite but limited diagnostic significance. The demonstration of tubercle bacilli, however, establishes the diagnosis beyond dispute. In this disease, therefore, the laboratory can render a unique service to the physician. It may be more fully utilized if the possibilities and limitations of bacteriological methods are understood.

THE BACTERIOLOGICAL DIAGNOSIS OF PULMONARY TUBERCULOSIS

Diagnostic significance of bacteriologic findings. The culturing of sputum and/or gastric contents is of paramount importance if a complete diagnostic picture is desired. If frequent and technically expert studies are made both positive and negative results have a diagnostic importance equalled by few laboratory procedures in any disease. Under the conditions just stated, the diagnostic significance of bacteriologic findings may be described as follows:

(1) Tubercle bacilli are demonstrable in practically 100 per cent of patients with frankly active pulmonary tuberculosis. Exceptions to this dictum are: In a considerable percentage of patients with hematogenous disseminations and without cavities, tubercle bacilli cannot be demonstrated for long periods of time. In about 20 to 30 per cent of patients with minimal, asymptomatic tuberculosis, tubercle bacilli cannot be demonstrated with the methods at present available.

(2) Failure to find tubercle bacilli on frequent subsequent examinations in patients who previously had positive findings, strongly suggests that the process has become arrested.

(3) Failure to find tubercle bacilli on at least ten specimens, if all available methods have been used, practically excludes the diagnosis of active pulmonary tuberculosis with the exceptions noted above.

(4) Demonstration of tubercle bacilli in sputum or gastric contents proves, for all practical purposes, the existence of active **pulmonary** tuberculosis. In rare cases, however, tuberculous lesions occur in the upper respiratory tract (including trachea and large

bronchi) which may shed bacilli in the absence of demonstrable pulmonary tuberculosis. Nonpathogenic acid-fast bacilli, which resemble but are **not** tubercle bacilli, have occasionally been observed and cultured from human secretions. In case of doubt, acid-fast bacilli must be identified by animal inoculation.

The diagnostic significance of negative bacteriologic findings depends on the clinical and roentgenological picture: In patients with moderate or large amounts of purulent sputum, with obviously active pulmonary lesions, even three or four negative smears and concentrates are a strong argument against the diagnosis of pulmonary tuberculosis. On the other hand, in patients with minimal or no sputum and in whom the pulmonary lesions are small, without cavitation and of questionable activity, negative bacteriologic findings assume diagnostic importance only after many cultures have remained negative.

Prognostic significance of bacteriologic findings. Disappearance of tubercle bacilli from previously bacilliferous secretions suggests that the process has become arrested. Absence of tubercle bacilli, at least in smears and concentrates, is one of the requirements in the National Tuberculosis Association's Diagnostic Standards for classifying a patient as "apparently arrested" or "arrested."

Fluctuations in the number of tubercle bacilli in sputum and gastric contents are frequent and have little prognostic significance. Grading of sputum records by the Gaffky scale should be discouraged. For clinical purposes it is sufficient to grade reports according to gross distinctions, such as "many bacilli," "few bacilli" and "very rare" on direct smear; "bacilli present only in concentrates"; "sputum or gastric positive on culture."

Methods for reasonably accurate estimation of the number of bacilli have been worked out but they are too complicated for routine use.

An irksome problem is the patient who, after adequate treatment, fulfills the requirements for the classification "arrested," but from whose sputum or gastric contents an occasional positive culture is obtained. Many such patients live normal lives without breakdown. There is, however, some evidence that such patients reactivate their disease more frequently than those in whom all cultures are negative.

Evaluation of bacteriologic methods. Under the assumption that competent laboratory work is done, one may expect that **cultures** of sputum and gastric contents may together contribute between 30 and 40 per cent of the total positive findings. Between 60 and 70 per cent of the new admissions, upon whom a positive diagnosis will be established by the examination of smears and concentrates, will be so diagnosed by one of the first three examinations.

These figures indicate general trends; they are, of course, largely dependent on the type of patients under consideration.

Even with the best available methods it is not possible to demonstrate tubercle bacilli in all patients with active tuberculosis. This is due to technical deficiencies and because some patients expel bacilli only at irregular intervals.

Collection of Specimens. Sputum: Sputum is collected in sterile wide-mouthed bottles with sterilizable screw-tops. At least 15 cc. should be collected, even if it takes several days to do so. Patients must, of course, be instructed to collect only sputum —that is, secretions coming up **from below the larynx, and not saliva or postnasal discharge.**

Gastric contents: Fasting gastric contents must be examined in all patients who have no sputum and those in which sputum examinations have been negative. Such specimens must be sent to the laboratory immediately after withdrawal and must be promptly prepared for culture, since prolonged contact with gastric juice seems to impair the viability of tubercle bacilli.

The Bacteriological Diagnosis of Pulmonary Tuberculosis, Max Pinner, M.D., Veterans Administration Technical Bulletin, October 10, 1946. (Original paper includes laboratory directions and bibliography.)

PUBLIC RELATIONS

PUBLIC RELATIONS AND THE INDIVIDUAL DOCTOR

The time was when the medical profession did not need to concern itself about its relations with the public. The position of the doctor as a leader in the community was unquestioned, and his word on medical matters was accepted as final. Within the past decade or so, there has been a subtle change. The public has become better—or worse—informed about health matters. *The Reader's Digest, Time, The Saturday Evening Post,* and other popular magazines have found that the layman laps up quasi-scientific articles on medicine as a cat laps cream. More dangerous is the potent and insidious propaganda fed the public by Isadore Falk, the brains of the Federal Security Agency, and his cohorts, who are busily engaged in smearing the medical profession in an attempt to bring about political control of medical practice. The millions of dollars spent by federal bureaucrats and the personal efforts of 45,000 federal employees to destroy the confidence of the people in the present system of medical practice[1] are bound to have some influence.

Part of the blame for the public's more critical attitude toward the medical profession, however, falls on the doctors themselves. Too many physicians have taken advantage of the shortage of medical personnel created by the war. A complaint heard everywhere these days is that it is almost impossible to get a doctor to make night calls[2]. The long overdue exposure of the practice of accepting rebates from optical houses and commer-

*Prepared for the Public Relations Committee of the Medical Society of the State of North Carolina:

Donald B. Koonce, M.D., Chairman — John S. Rhodes, M.D.
Amos N. Johnson, M.D.
J. Stuart Gaul, M.D. — H. H. Briggs, M.D.

1. "The Unauthorized and Illegal Expenditure of Public Moneys," Editorial, North Carolina M.J. 8:450 (August) 1947
2. See Editorial, "Night Calls," in this issue.

cial laboratories has not won any friends for the medical profession.

Whatever the reasons for the changed attitude of the public toward their physicians, it is obvious that something must be done to convince people that the doctors are their friends; that, while the medical standards in this country are the best in the world, organized medicine is constantly striving to raise them still higher; and that political control of medicine would inevitably mean inferior medical care.

The American Medical Association is making a serious effort to improve the public relations of the medical profession from the national standpoint. Our State Society had one of the first Public Relations Committees in the country, and now, under the able leadership of Dr. Donald Koonce, this committee is more active than it has been in years. Public relations at the national and state levels are important; but no public relations program, regardless of how vast and costly it may be, can succeed without the cooperation of the county medical societies and the individual doctors who compose them.

Every county society in the state should have its own public relations committee. One of the first things the chairman of such a committee should do is to seek a conference with representatives of the local paper or papers. He should give them the names of his committee members, and tell them that any one of these doctors will be glad to supply information about any medical matters that may arise. This committee may also assume the task of furnishing speakers for medical talks whenever they are needed. It is not too much to ask that every candidate for public office who lives in the committee's sphere of influence be interviewed by a member of the committee, by his family doctor, or by any physician who knows him well.

Even after the official public relations committees of the national, state, and county medical societies have put forth their best efforts, the layman's opinion of the medical profession finally boils down to his opinion of the individual doctors with whom he comes in contact. "Good public relations depends upon good works—not so much on how widely we are known, but on how favorably we are known. . . . Our public relations cannot be successfully promoted by any one individual. . . or by any group hired to develop this program. This undertaking is a project in which each must do his part . . . working as a team . . . to inform the people of our desire to be of service to them."[3]

At the annual meeting of the Medical Society of Pennsylvania in Pittsburgh last September, one of the best exhibits presented was that of the Committee on Public Relations. Members in attendance were invited by one sign after another to meet the best public relations man the medical profession has. These signs finally led to a booth containing a full-length mirror. What the Pennsylvania Medical Society was trying to get across to its members is equally applicable to the members of the Medical Society of the State of North Carolina: *"Every time you look at yourself in the mirror, you see the man who can do the best public relations job for you . . . and your profession."*[3]

WINGATE M. JOHNSON, M.D.
Winston-Salem.

3. From a pamphlet, "No Idle Challenge," put out by the Coordinating Committee on Public Relations of the Medical Society of the State of Pennsylvania.

CORRESPONDENCE

To the Editor:

I have read with interest and approval the editorial, "'Preventive Medicine and Voluntary Health Insurance," in your January issue. The adoption of the suggestions in this editorial would indeed extend the coverage of voluntary health insurance into a more nearly adequate program to combat socialized medicine.

The section dealing with the payment of professional fees for surgical care only is of particular significance. The obvious conclusion is that the insurance companies have decided that hospitalization for an operation is of more importance than hospitalization for a medical condition. Payments for medical professional fees during a period of hospitalization should be covered as are surgical professional fees at present.

There is one point of particular importance not mentioned in this editorial. As the editorial points out, insurance is bought to cover the cost of unpredictable financial catastrophe. Hospital insurance coverage

has lagged far behind rising hospital costs. I refer not only to actual increases in room rates and hospital procedures due to increased cost of operation, but to the expensive new therapeutic agents, such as streptomycin and penicillin, which medical science has made available in the last few years.

Hospital insurance is of little help in a long and serious illness which requires hospitalization. The greatest percentage of total coverage is on the short stay of a few days to two weeks where few "hospital extras" are required. The patient who needs the maximum help is the one who is forced to be away from work for a long period of hospitalization and convalescence. I believe that a study would reveal that a very small percentage of total hospitalizations are for illnesses of particular severity or of long duration. I am referring primarily to such conditions as a brain or lung tumor, or Rocky Mountain spotted fever. Hospital insurance could protect the patient against illnesses of this sort by paying for more of the expensive extras (other than room and board) which cause the bills to rise to such enormous proportions. If necessary, some form of exclusion on minor conditions (such as making the patient pay for the first two days) could be inserted into the policy to help pay the cost of this. I doubt that the cost of covering these severe illnesses would be enough to necessitate this measure, however.

Obviously the insurance company needs protection against unjustified charges or extended unnecessary stays, and a fairly complete report would have to be filed with the insurance company on each such admission.

These thoughts are offered only as additional suggestions for improving our insurance protection. We can all agree that the Blue Cross Plans have done an amazing job of growth and coverage in the last few years. The job is not yet completed and there must be constant improvements in the coverage offered.

Yours very truly,

C. T. HARDY, JR.
Business Manager, Private Diagnostic Clinic, Bowman Gray School of Medicine of Wake Forest College

BULLETIN BOARD

STATE BOARD OF MEDICAL EXAMINERS

The North Carolina Board of Medical Examiners will hold a meeting for the purpose of licensure by endorsement of credentials on May 4 at the Carolina Hotel, Pinehurst, at 10 a.m.

The board will hold its annual written examination for the purpose of licensure at the Sir Walter Hotel, Raleigh, June 21-24. Applicants for licensure by endorsement of credentials will be interviewed on June 22, the board to convene at 10 a.m.

NORTH CAROLINA ACADEMY OF GENERAL PRACTICE

The North Carolina branch of the American Academy of General Practice was organized in Greensboro on February 22, with ninety doctors present. Dr. John R. Bender of Winston-Salem was elected chairman, Dr. W. A. Sams of Marshall vice chairman, and Dr. Roscoe McMillan of Red Springs secretary and treasurer.

THE NORTH CAROLINA LEAGUE FOR CRIPPLED CHILDREN

For the thirteenth year, the North Carolina League for Crippled Children invites its friends to share in financing its work during the Annual Easter Seal Campaign, February 28 through Easter, March 28. During the past year the generous contributions of the public made it possible to expand considerably the program of the League.

Among the services rendered by the League during the past year were:

1. **Medical Care:** Specialized care to insure the best possible physical correction included orthopedic operations, orthodenture treatments, blood transfusions, clinical treatments, hospitalization, convalescent home care, and physician's visits to homes.
2. **Artificial Aids:** Artificial limbs, extension shoes, crutches, wheel chairs, glasses, hearing aids, and a plastic ear were provided.
3. **Transportation:** To clinics, hospitals, and schools.
4. **Education:** a) Special training classes at the University of North Carolina for teachers interested in working with handicapped pupils.
   b) Summer Educational Center for handicapped children.
   c) A speech correction program in one city school.
   d) An orthopedic class in two city schools.
   e) Bedside teaching in hospitals and private homes.
   f) Boarding school for pupils who cannot get to and from public school.
   g) Speech therapy and remedial reading for children in two counties.
   h) Educational publicity through conferences and bulletins to inform the public of the needs of crippled children.
5. **Research:** The League staff made a nation-wide study of laws pertaining to the education of handicapped children. Following this study, a bill was drafted and introduced to the 1947 General Assembly. The General Assembly approved the bill, so now the type of education

needed by the handicapped children in North Carolina through the public schools will be made available to them, as soon as teachers can be trained in specialized methods needed for conducting such classes.

6. **Other Services:** Referral to proper agencies of requests for services not available from the League. Interpretation to parents of children's condition and needs when the physician was unable to talk with parents. Supplemented services of other agencies for needs not included in scope of their program.

The League is a private social agency that cooperates with, but does not duplicate the work of, other public and private charitable organizations. It aids the crippled whether the condition resulted from accident, disease, infection or birth. Its only requirement for aid—a valid need not otherwise provided for. Its main source of funds —voluntary contributions during the annual Easter Seal Campaigns.

The consistent growth of the League during the past years reflects both the fundamental need for such an agency, and the increase of public confidence in its program. Your contribution at this time will improve the lot of one or more crippled children. For whatever your heart prompts you to give, the children say "thank you and Happy Easter."

News Notes from the University of North Carolina

The Department of Public Health Nursing, School of Public Health, announces that a new course called "Special Fields in Public Health Nursing," has been added to the requirements for candidates for the certificate and also for the degrees.

The ever increasing demands made on public health nurses indicate that, in order to keep abreast with the expanding services, knowledge of these special fields is essential. A nationally known authority, a specialist in his field, will be in charge of each subject presented. The course carries 5 quarter hours of credit and is designed for consideration of the functions and responsibilities of public health nurses in the various phases of public health not already included in "Maternal and Child Health Services." It covers particular fields of public health nursing which require adaptation in organization and administration. These fields include mental hygiene, cancer control, geriatrics, tuberculosis nursing, and orthopedic nursing.

Advantages:

The advantages of this course are threefold. It offers to the regularly enrolled students or nurses an opportunity for instruction in a variety of timely subjects. Those who wish to enroll for one quarter of work during the summer may receive instruction in the five subjects offered during a short period of time. To those who cannot be released from the ever-pressing work of an agency for a five weeks period, it is possible to enroll for one week. Those who wish may enroll for any week which holds greatest interest for them.

While this course is designed especially for public health nurses, other interested people such as community workers, social workers, health educators, and teachers, are invited to enroll.

News Notes from the Bowman Gray School of Medicine of Wake Forest College

Dr. George T. Harrell, Jr., professor of medicine, met with representatives of other Southern medical schools at Oak Ridge, Tennessee, March 1 and 2, to work out a plan whereby the schools can supply the medical research staff for the Oak Ridge Hospital. The hospital is initiating clinical research in the treatment of leukemias and other malignant diseases, using short-lived radio-isotopes directly from the nuclear reactor there. The Atomic Energy Commission and Institute of Nuclear Studies at Oak Ridge jointly sponsored the meeting.

Dr. Harrell and Dr. David Cayer attended a course in the study of nuclear energy and the medical effects of the atomic bomb at the Army Medical School in Washington, D. C., in February.

* * * *

Miss Gladys E. Frazier of Rochester, New York, has joined the staff of the department of neuropsychiatry as psychiatric social worker. Joseph A. Grassi, former head of the psychology department at the State Hospital in Fairfield, Connecticut, is new associate in clinical psychology at Graylyn.

* * * *

Dr. Manson Meads, instructor in medicine, has been appointed a "Scholar in Medical Science" by the John and Mary R. Markle Foundation in its new post-fellowship program to provide an opportunity for promising scientists to develop as teachers and investigators. He is one of sixteen men in the country to be named for such an appointment. The appointment carries with it a grant of $25,000, payable to the cooperating medical school at the rate of $5,000 annually for five years.

News Notes from the State Board of Health

During 1947, according to the provisional report of the Bureau of Vital Statistics, 113,020 babies were born in North Carolina, an increase of 12,425 over the previous year. The 1947 birth rate of 29.3 is the highest since 1925, when a birth rate of 29.7 was recorded. The 1946 birth rate in North Carolina was 26.3.

The infant mortality rate last year was only 35.4, as compared with 37.9 the previous year—a decrease of 2.5. The infant mortality rate is based on the number of babies under a year old who die, for every one thousand live births. The maternal death rate last year was 1.8, compared with 2.0 the previous year. This rate is based on the number of mothers who die for every one thousand live births.

Births outnumbered deaths in North Carolina last year, by more than three to one. The death rate for 1947 was 7.8, with 30,252 deaths from all causes. There were just 6 deaths from typhoid fever, 33 from diphtheria, 54 from whooping cough, and 2 from malaria. Death rates from degenerative diseases continue to climb. Of the 30,252 deaths from all causes reported to the State Board of Health last year, 13,643 were caused by diseases of the heart and circulatory system. The death rate from pulmonary tuberculosis last year was only 25.4, as compared with 27.9 in 1946.

In recognition of the work being done by Miss Annie Gaynor, city health nurse, in connection with the club's Hard-of-Hearing Project, the Rocky Mount Exchange Club designated one of its regular weekly meetings as "Annie Gaynor Night." J. D. Weaver, past president of the club, after reviewing the accomplishments of the Hard-of-Hearing Project, presented Miss Gaynor with a traveling bag as a token of appreciation for the faithful work she is doing in the Rocky Mount Schools to determine which of the children have hearing deficiencies.

* * * *

Last year Dr. R. A. Kesler, chairman of the American Veterinary Medical Association's special committee on **rabies**, called a meeting of representatives of the American Public Health Association, the American Medical Association, the United States Public Health Service and other interested organizations, which was held at the University of Pennsylvania. The Conference unanimously agreed that in a program for the control of rabies in the United States prime consideration must be given to (1) adequate diagnostic facilities, (2) the control of animals capable of transmitting the disease, and (3) mass immunization of susceptible animals, particularly dogs.

Control measures for animals capable of transmitting rabies should include:

(a) Licensing of all dogs.

(b) Proper disposition of ownerless, unwanted and stray domestic animal pets.

(c) As soon as rabies appears in a community, strict control of all dogs should be enforced for whatever period of time may be considered necessary. Dogs should not be permitted to run at large.

(d) Dogs which have bitten persons or other animals, and dogs which are suspected of having rabies should be confined in a suitable, authorized place under veterinary supervision for a period of not less than fourteen days.

(e) Dogs known to have been exposed to rabies should be destroyed or kept confined for a period of not less than six months.

(f) Dogs under 6 months of age, being particularly susceptible and less satisfactorily immunized than older animals, should be confined until the area is certified as officially free of rabies.

(g) The control program should be continued for a period of at least 90 days subsequent to the last reported case of the disease.

(h) Should rabies be found to exist in wild life prompt arrangements should be made for active cooperation with the U. S. Fish and Wild Life Service and the analogous agency of the state involved.

Mass Immunization.—The vaccination of dogs, combined with other control measures as indicated herein, provides the most satisfactory method for the prompt control of rabies. Vaccinated dogs, when properly tagged, may be allowed at large thirty days after vaccination. Vaccination should consist of at least one injection of an immunization dose of an accepted canine rabies vaccine. Evidence indicates that a single 5 cc. subcutaneous injection of an approved vaccine is effective in a mass vaccination program. However, the injection of three doses of vaccine in 5 cc. amounts a week apart provides greater immunization and should be advised when practical. For permanently reducing the number of susceptible dogs, it should be suggested that owners have their dogs immunized annually.

News Notes from the North Carolina Tuberculosis Association

Mrs. Charles E. Platt of Charlotte, a member of the Board of Directors of the North Carolina Tuberculosis Association for twenty-four years, died on February 12.

New Public Health Nursing Course at North Carolina College

Miss Esther Henry, R.N., B.S., M.S., of New York city, has been appointed director of the course of Public Health Nursing at the North Carolina College in Durham. Miss Henry has a rich experience with official and non-official agencies. The appointment of Miss Henry and the opening of the first postgraduate course in public health nursing at North Carolina College is the realization of a dream of the late Dr. James E. Shepard.

Second District Medical Society

The Second District Medical Society met at New Bern on February 18 as guests of the Craven County Medical Society. The meeting was called to order by Dr. William Willis, and a delicious turkey dinner was enjoyed. About a hundred doctors and guests were present. After dinner Dr. W. L. Thomas, assistant professor of gynecology at the Duke University School of Medicine, read a paper on "Psychosomatic Gynecology." This paper was discussed by Dr. Leslie Lee of Kinston, Dr. John C. Tayloe of Washington, and Dr. Paul Whitaker of Kinston. Dr. R. D. McMillan, secretary of the North Carolina Medical Society, then made an address .

It was decided to have the next meeting at Kinston. Dr. Floyd Wooten was elected president and Dr. Leslie Lee secretary.

Fourth District Medical Society

The Fourth District Medical Society met with the Edgecombe-Nash Counties Society in Rocky Mount on February 10. Dr. K. D. Weeks spoke on "Congenital Heart Disease" and Dr. Kenneth Wright on "Hernia."

Forsyth County Medical Society

Dr. Louis N. Katz of Chicago was guest speaker at the February meeting of the Forsyth County Medical Society, held in Winston-Salem on February 10. His subject was "Principles of Digitalis Therapy."

New Hanover County Medical Society

The February meeting of the New Hanover County Medical Society was held at the U. S. Naval Hospital, Camp Lejeune, where the members of the Society were guests at the Naval Hospital. Following dinner Dr. R. B. Rodman spoke on "Hypertension" and Dr. W. S. Dosher on "Newer Advances in Obstetrics."

Recently the chiefs of the Medical and Surgical Services at Camp Lejeune presented papers at the regular monthly meeting of the New Hanover County Medical Society.

News Notes

Dr. Thomas F. Vestal, for the past five years director of the Division of Tuberculosis Control of the State Board of Health, resigned last month to become superintendent and medical director of the Forsyth County General Hospital and Home for the Indigent and Infirm.

Recording Your Data in the New American Medical Directory

The American Medical Association reports that 115,000 physicians have returned their Directory Information Cards supplying data for the new **American Medical Directory** now being compiled. Those physicians who have received these cards and have not returned them are urged to do so at once. This information is needed for your listing in the 1949 directory.

Please use the card that has been addressed to you, as it bears the serial number which has been assigned to your data. If a card is received by you addressed to another physician who has moved away, return the card with the doctor's new address written on the slip bearing his name and serial number if you can supply the information.

Before filling out your card, check the list of specialties on the back of the card and select only one specialty, indicating, in the space provided on the front of the card, either that your practice is limited to that specialty or that you give special attention to that branch of medicine along with general practice. Fill in the lines marked "Intern" and "Resident" **only** if you are now serving an internship or residency in a hospital.

A second request with a duplicate Information Card will be sent very soon to all physicians from whom cards have not been received so that they may have an opportunity to supply the necessary information for their listing in the Directory.

In checking the information cards received from physicians, the Directory Department of the A.M.A. reports that it becomes increasingly apparent that many are not aware of the difference between "Membership" and "Fellowship" in the American Medical Association. Here are the official definitions:

> Every MEMBER in good standing in the constituent medical association of the state in which he is engaged in practice whose name is officially reported to the Secretary of the American Medical Association for enrollment becomes automatically a MEMBER of the American Medical Association and is not called on, as such, to pay any dues or to contribute financially to the Association.
>
> MEMBERS of the American Medical Association are eligible to apply for FELLOWSHIP. To qualify as a FELLOW, a MEMBER in good standing is required to make formal application for FELLOWSHIP, to pay FELLOWSHIP dues and to subscribe for **The Journal.** Applications must be approved by the Judicial Council. FELLOWSHIP dues and subscription to **The Journal** are both included in one annual payment of $12.00, which is the cost of **The Journal** to subscribers who are not FELLOWS. MEMBERS of constituent state medical associations pay dues to those bodies, but as MEMBERS they pay nothing to the American Medical Association. FELLOWS pay dues and subscription to **The Journal** in the sum of $12.00 a year, which has nothing to do with county or state dues.
>
> According to an amendment to the By-Laws of the American Medical Association, no physician may be officially recorded as a MEMBER of the American Medical Association except on the basis of membership in **one** constituent state medical association, and that one the association of the state in which the physician concerned maintains legal residence and engages in the practice of medicine.
>
> Each Fellow receives a Fellowship Card from the Association annually as payment of his dues is recorded, which card is presented for admission to the Annual Meetings of the Association.
>
> Physicians who are eligible for Fellowship should make formal application immediately so that they may attend the Chicago Session and so that a record of their Fellowship may be received in time to include the Fellowship symbol in their data listed in the new **American Medical Directory.**

Mental Hygiene Society of Virginia

The eleventh annual meeting of the Mental Hygiene Society of Virginia was held at the Medical College of Virginia in Richmond on February 19.

Seminar in Psychiatry

The Department of Mental Hygiene and Hospitals, the American Psychiatric Association, the Medical Society of Virginia, and the U. S. Public Health Service have planned a two-week seminar in psychiatry, to be held in Richmond from April 5, to April 16 inclusive. During this two-week period it is expected that the various phases of mental disease and hospital treatment will be covered by such widely known physicians as Dr. Franklin G. Ebaugh, Director of the Colorado Psychopathic Hospital, Denver, Colorado; Dr. Thomas M. French, Chicago Institute of Psychoanalysis; Dr. Samuel W. Hamilton, Superintendent of Essex County Hospital, New Jersey; Dr. Gregory Zilboorg, New York City; Dr. R. Finley Gayle, Dr. David C. Wilson, Dr. J. Asa Shield, of Virginia; Dr. John Whiteborn, Johns Hopkins University; Dr. Winfred Overholser, Washington, D. C., President of the American Psychiatric Association; Dr. Frederick H. Allen, Director of the Philadelphia Child Guidance Clinic; Dr. Leo Kanner, Johns Hopkins University; Dr. Robert H. Felix, U. S. Public Health Service; Dr. C. C. Burlingame, of the Institute for Living, Hartford, Connecticut; Dr. Leland Hinsie, Professor of Psychiatry, Columbia; Dr. Abraham Myerson, Boston, Massachusetts; Dr. Nolan D. C. Lewis, New York City, and many others.

There will be no charge for attendance at this seminar and it will be open to all physicians, psychologists, and associated workers in the field of psychiatry.

Ophthalmologic Clinics on Beta Irradiation With Radium "D"

A. D. Ruedemann, M.D., F.A.C.S., Professor and head of the Department of Ophthalmology, Wayne University College of Medicine, Detroit, will give clinics on Beta irradiation in Ophthalmology at the City of Detroit Receiving Hospital, Macomb and St. Antoine Streets, **every other** Wednesday from 10 to noon until June, beginning March 10. The use of the new radium "D" ophthalmologic applicator will be demonstrated. All ethical specialists are invited to attend.

American Association of Industrial Physicians and Surgeons

The thirty-third annual meeting of the American Association of Industrial Physicians and Surgeons and participating allied groups will be held at the Hotel Statler in Boston, March 27-April 4. Physicians, nurses, and all persons interested in the field of industrial medicine are invited to attend.

The American Society for the Study of Sterility

The American Society for the Study of Sterility is holding its Fourth Annual National Session on June 21 and 22, 1948, at the Congress Hotel in Chicago. The two-day program will be divided into a special series of panel discussions on male infertility, with papers to be read on female and miscellaneous infertility aspects on the second day.

Additional information may be obtained from the secretary, Dr. John O. Haman, 490 Post Street, San Francisco 2, California.

Sixteen Scholars in Medical Science Announced by Markle Foundation

Sixteen young scientists have been appointed as the first group of Scholars in Medical Science, under the plan announced last fall by the John and Mary R. Markle Foundation to support qualified young scientists who wish to make a career in academic medicine. The Scholars were selected from candidates nominated by accredited medical schools in the United States and Canada by regional committees appointed by the Foundation. Toward the support of the Scholars and their research the Foundation has allocated a total of $400,000 to their respective medical schools, each school to receive $25,000 payable at the rate of $5,000 annually for five years.

As faculty members of the participating medical schools, the Scholars will devote the next five years to teaching and research, at the end of which time they will have had an opportunity to become established teachers and investigators. According to John M. Russell, Executive Director of the Foundation, an undetermined number of Scholars will be appointed each year for the next few years for the long-range purpose of strengthening the faculties of medical schools, and medical education generally.

Among the sixteen Scholars whose appointments begin in 1948 are Ivan W. Brown, Jr., of the Duke University School of Medicine, whose field of research is injury produced by transfusion; and Manson Meads, of the Bowman Gray School of Medicine, whose field of research is infectious diseases.

Federal Security Agency

Oscar R. Ewing, Federal Security Administrator, has announced the formation of a National Health Assembly, to be held in Washington, May 1-4. The Assembly is being set up as a result of the message of President Truman to Mr. Ewing of January 30 in which Mr. Ewing was requested to develop feasible national health goals for the next ten years.

Twenty-four national leaders in various fields have been invited by Mr. Ewing to serve on the executive committee of the Assembly, which will consist of representatives of public and private organizations and agencies in the country concerned with various phases of the nation's health. Preliminary estimates are that 700-800 people will attend the Assembly sessions.

United States Public Health Service

Dr. Leonard A. Scheele, assistant surgeon general of the United States Public Health Service and director of the Cancer Institute, has been named to succeed Dr. Thomas Parran as surgeon general when the latter's term expires in April.

* * * *

Previously withheld from publication for security reasons, results of research on the blood fluke infection, schistosomiasis, have been released by the U. S. Public Health Service of the Federal Security Agency in "Studies on Schistosomiasis," National Institute of Health Bulletin No. 189.

The 212-page "Studies on Schistosomiasis" may be purchased through the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 50 cents per copy.

* * * *

Fellowships leading to a Master's Degree in Public Health in the field of Health Education are again being offered to any qualified United States citizen between the ages of 22 and 40, according to a statement released recently by the United States Public Health Service, Federal Security Agency. Funds are available through a grant from the National Foundation for Infantile Paralysis.

Information and application blanks may be obtained by writing the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

National Negro Health Week

April 4-April 11, 1948

The need for a health plan for the individual Negro and his family will be emphasized in this year's National Negro Health Week, scheduled for April 4 to 11. Chairman of the Health Week Committee is Dr. Roscoe C. Brown, chief of the Office of Negro Health Work, Public Health Service, Federal Security Agency.

Special tribute will be paid to Booker T. Washington, whose birthday will be celebrated on April 5. Dr. Washington founded the Health Week movement in 1915. After his death, the annual program was carried on at Tuskegee Institute and Howard University until 1932, when it was made a part of the Public Health Service year-round activities.

The theme of this year's National Negro Health Week will be "A Practical Health Program for Myself and My Family. Learn what we ought to know—Health Education. Do what we ought to do—Healthful Living."

Groups interested in taking part in National Negro Health Week activities may obtain information and supplies by writing Dr. Roscoe C. Brown, chief, Office of Negro Health Work, U. S. Public Health Service, Federal Security Agency, Washington 25, D. C. For information about the observance of Health Week in their own communities, they may get in touch with their state, county or local health department.

(BULLETIN BOARD CONTINUED ON PAGE 172)

BOOK REVIEWS

A Text-Book of Pathology. By William Boyd, M.D., Dipl. Psych., M.R.C.P., Edin.; F.R.C.P., Lond.; LL.D., Sask.; M.D., Oslo; F.R.S.C. Professor of Pathology and Bacteriology of the University of Toronto. Ed. 5. Price, $10.00. 1049 pages. Philadelphia: Lea and Febiger, 1947.

The latest revision of this fine standard textbook continues the high standard set in previous editions. The subtitle, "An Introduction to Medicine," sets the tone of the book. Pathology is presented with a physiologic outlook in an attempt to bring together knowledge on disease processes from all the fields of medicine. The first portion discusses general principles of pathologic processes. The second portion discusses lesions in specific organs.

The book is very generously illustrated with photographs and photomicrographs—a technique which gives a true representation of the changes seen visually. A few drawings are used, of which some are in color; they add little to the book. The few color photographs are far superior. Many references are quite old.

The book is not intended to be used as a reference book by practicing pathologists. It is written from the viewpoint of the student, both undergraduate and graduate. It should be very useful for practicing physicians who wish to review the subject or to get a fresh outlook on disease in their patients.

Dermatologic Clues to Internal Disease. By Howard T. Behrman, M. D., Assistant Clinical Professor of Dermatology, New York University College of Medicine. 165 pages. Price, $5.00. New York: Grune and Stratton, Inc., 1947.

The preface of this book states that there is an apparent need for a correlation of the manifestations of skin disorders with those arising in some visceral dysfunctions. If correlation is to be considered the author's purpose, it is this reviewer's opinion that he falls far short of the goal. The book consists of an alphabetical list of diseases, ranging from acanthosis nigricans to yellow fever, with a brief description of the cutaneous lesions that may appear in each condition. Little attempt is made to distinguish between rare cutaneous lesions and the more common types that are useful for diagnosis. No correlation is offered between the various diagnostic categories discussed, even when the skin lesions are similar, and little effort is made to correlate the skin findings with the more basic internal dysfunction.

As the descriptions are listed only by diagnosis, it is necessary to make the diagnosis, or suspect it, before consulting the text. The inclusion of the term "clues" in the title is therefore somewhat misleading. The author states that he has avoided "lengthy dissertations" and "disconcerting theoretical controversies," and the text thus contains no indication that there might be any difference of opinion among authorities about any of the topics mentioned. As there is no index and no table of contents, the book would be most difficult to use for reference, especially in conditions that have been given more than one diagnostic term.

The photographs are the most interesting part of the book, 118 illustrations being offered.

Handbook of Communicable Diseases. By Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P., Medical Director, Herman Kiefer Hospital; Clinical Professor of Preventive Medicine and Public Health, Wayne University College of Medicine; Extramural Lecturer in Infectious Diseases and Epidemiology, School of Public Health, University of Michigan; Consultant, Preventive Medicine Section, Surgeon General's Office, United States Army. Ed. 2. Price $9.50. 992 pages. St. Louis: The C. V. Mosby Company, 1947.

The author continues the useful organization of material found in the first edition. The relationship between the infecting agent and the immunity of the host is considered. The methods of preventing communicable disease and the principles of nursing care, both in the home and in the hospital, are covered. The specific diseases are classified by the portal of entry into the body—respiratory tract, gastrointestinal system, mucous membranes, or skin. Each classification is further subdivided according to the type of infecting agent—fungi, bacteria, or viruses.

The appendix contains informative tables on the frequency of complications in the most common infectious diseases, and on quarantine regulations, spinal fluid findings, and the schedule for therapy of syphilis. Both the black-and-white and the color illustrations are good. References to specific points and general references have been kept up to date and are found at the end of each chapter.

Many additions have been made to the second edition, such as the chapters on atypical pneumonia, rheumatic fever, and infectious hepatitis. In some places throughout the book the discussions of chemotherapy are not always up to date, but advances in this field are very rapid. It is surprising that the author has kept so well abreast of recent practice. The book is recommended for students and practitioners.

Elements of Genetics. By Edward C. Colin, Ph.D., Chicago Teachers College. Ed. 2. 402 pages. Price, $3.50. Philadelphia: The Blakiston Company, 1946.

The second edition of Colin's textbook of genetics carries the subtitle, "Mendel's Laws of Heredity with Special Application to Man." The material covered has been thoroughly revised and brought up to date since the 1941 edition. The author states that his purpose is to present a clear and readable account of the elements of the science of genetics, and he has succeeded in covering the essential principles in a concise and easily understandable manner.

The importance of hereditary factors in determining predisposition to disease is rapidly becoming more widely recognized. Physicians are finding that a ready source of reference to basic principles of genetics is increasingly useful. This book is recommended as an adequate source of basic information, and throughout the text one will find examples of the application of principles to specific situations in human families.

A glossary of genetic terms is appended, and the index is adequate for easy reference. The text is illustrated by ninety photographs and drawings.

Minor Surgery. By **Frederick Christopher,** M.D., F.A.C.S., Associate Professor of Surgery at Northwestern University Medical School, Chief Surgeon, Evanston (Illinois) Hospital. Ed. 6. 1058 pages, 937 illustrations on 595 figures. Price, $12.00. Philadelphia & London: W. B. Saunders Company, 1948.

This volume presents a detailed review of the literature on each subject discussed, and in this fact lies its major fault. For example, 451 references are given on open lesions and 409 on injuries of the upper extremities. So numerous are the authors quoted that their various opinions, at times contradictory, produce confusion instead of giving a definite idea as to pathogenesis, diagnosis and treatment. In this respect, and in the organization, this volume falls far below the high standard set by the author's **Textbook of Surgery.**

The relative lack of organization produces frequent repetitions, and a particular example of wasted space is the nearly identical paragraphs on tennis leg found on pages 6 and 749. Drugs and dosage are given in the apothecary or metric system, apparently without plan; and occasionally both are used in the same prescription, the drugs being written in Latin and the amounts in grams. From this practice a serious error results on page 292, where the dose of sodium luminal for restlessness due to head injury is given as 2 Gm. hypodermically. A few omissions are of major import, such as failure to mention lower nephron nephrosis under the discussion of burns, sucrose, sulfonamides, or blood transfusion, and to warn of homologous serum jaundice in the section on plasma administration. Greater unity and usefulness would be attained if less were written about the very rare lesions and about apparently outmoded ideas. The number of typographical errors is greater than is usually seen in a book by this publisher.

Because of the extensive review of the literature provided, this volume may be recommended as a source for references. Although the author implies in the preface that the book is intended for those less well trained in surgery, it would appear that this is the group for which it is least suited. Considerable experience would be necessary to select the best from the several methods of treatment given in many instances.

Sex Power in Marriage. By Edwin W. Hirsch, B.S., M.D. 218 pages. Price, $3.00. Chicago: Research Publications, 1947.

Sigmund Freud certainly started something—to use a slang phrase—when he stressed the importance of sex in psychology. Much has been written about the necessity of maintaining a normal outlook upon sex life, especially after marriage. This little book of Dr. Hirsch's discusses frankly, but decently, the prevalence of sexual difficulties, and suggests ways for overcoming them. It is perhaps as safe a guide to attaining a normal sex life as most that have been offered the public.

A number of case reports make up the last chapter in the book, and should help intelligent laymen to understand themselves.

Psychopathology and Education of the Brain Injured Child. By Alfred A. Strauss, Psycho-Educational Consultant, Evanston, Illinois; President, Cove Schools for Brain-Injured Children, Racine, Wisconsin; and Laura E. Lehtunin, Psycho-Educational Director, Cove Schools for Brain-Injured Children. 206 pages. Price, $5.00. New York: Grune and Stratton, Inc., 1947.

The authors present the thesis of this volume as follows: "A brain injured child is a child who before, during, or after birth has received an injury to or suffered an infection of the brain. As a result of such organic impairment, defects of the neuromotor system may be present or absent; however, such a child may show disturbances in perception, thinking, and emotional behavior, either separately or in combination. These disturbances can be demonstrated by specific tests. These disturbances prevent or impede a normal learning process. Special educational methods have been devised to remedy these specific handicaps."

It is the belief of the authors that the brain injured child can be distinguished from the defective child and from the behavior problem. The criteria on which this distinction can be made are: first, the history of head injury either before, during or subsequent to birth; second, the presence of certain neurologic abnormalities on physical examination; third, the finding of a single child with low intelligence among siblings and relatives of good intelligence; and fourth, the presence of certain specific psychologic disturbances as seen on special qualitative tests.

It is suggested that certain psychologic disturbances result from brain injury, regardless of the location of the injury. The most outstanding characteristics of these disturbances are: (1) disinhibition (drivenness); (2) the catastrophic reaction (Goldstein); (3) distractibility, or forced responsiveness to stimuli (evidenced by undue fixation upon irrelevant stimuli and instability between figure and ground patterns); (4) perseveration (the persistent repetition or continuation of an action once begun); (5) the use of substitutions and detours in the performance of difficult tasks.

The authors describe in detail the method of testing individuals suffering from these defects and the ways by which the brain injured child can be distinguished from the defective or maladjusted one. After analyzing the defects observed, they then present in detail the training methods which they have found helpful in teaching brain injured children.

The book is an excellent presentation of methods of study in such cases and of teaching methods which may be used in dealing with specific problems. The thorough attention to detail in dealing with individual cases, the careful analysis of the particular defects noted, and the presentation of specific measures which are used in dealing with them in individual cases make the book particularly useful.

This book is a valuable addition to the library of anyone concerned with the diagnosis and treatment of brain injured children.

BULLETIN BOARD

(CONTINUED FROM PAGE 169)

Veterans Administration

Medical records of more than 100,000 ill and disabled World War II veterans will be used to aid researchers in their efforts to discover the causes and cures of little-known diseases and unusual injuries.

Object of the program is to analyze the medical records of such veterans, and through study of the history of their ailments and of the medical treatment given, thus attempt to arrive at sound medical conclusions and recommendations for the care of others who might incur these same disabilities.

The work will cover a wide variety of diseases and injuries. Among the studies already underway is one on neuropathologic changes in peripheral nerve injury, which is being conducted by Dr. Barnes Woodhall at the Duke University School of Medicine.

* * * *

Carl R. Gray, Jr., Administrator of Veterans Affairs, has announced that Veterans Administration will reduce its personnel by approximately 8,500 employees before the end of the current fiscal year, June 30, 1948.

The planned reductions are to be made in services other than medical. No decreases are contemplated in the VA medical program for the balance of this fiscal year, ending June 30, 1948. In VA's recommended budget for the fiscal year 1949, an increase is proposed in the medical program.

Preventive Medicine Gets Interim Specialty Board

Consultants and practitioners of preventive medicine, one of the least formalized but most universally important branches of medical science, learned that a great forward step toward professional recognition of their calling as a distinct medical specialty has been made by the formation of an "Interim Board" of Preventive Medicine. Announcement of the move was made jointly by the Surgeon General of the Army, Navy, and U. S. Public Health Service.

American College of Surgeons

The American College of Surgeons takes pleasure in announcing the completion of a new teaching film "Anomalies of the Bile Ducts and Blood Vessels: Strictures of the Common Duct." This film is now available for loan or purchase and is the first in the series of teaching films being produced under the expanded motion picture program.

The picture was directed by Warren H. Cole, Professor of Surgery and Head of the Department, University of Illinois School of Medicine, with the cooperation of an advisory committee. Inquiries may be directed to Ethicon Suture Laboratories, Division of Johnson & Johnson, New Brunswick, New Jersey.

The National Foundation for Infantile Paralysis

The 1948 edition of "Facts and Figures about Infantile Paralysis," a publication of the National Foundation for Infantile Paralysis, is now available to physicians and public health workers. Statistics on the disease, revised yearly, are gathered from the United States Public Health Service, state health departments and various other sources.

Copies of the booklet (No. 59) may be secured free of charge by writing Education Service, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

This Week in Chicago Medicine

The Chicago Medical Society has inaugurated a weekly mimeographed publication entitled "This Week in Chicago Medicine." It has been designed to keep the medical profession posted on "what's going on" and to aid out-of-town physicians who may be in Chicago and wish to visit clinics, conferences, round tables or medical meetings.

Any doctor planning a trip to Chicago may secure copies of this bulletin by writing to the Chicago Medical Society, 30 North Michigan Avenue, Chicago 2, or he may secure copies by calling in person.

FOR SALE

Lake Lure, North Carolina

Charming mountain retreat in beautiful Blue Ridge, suitable for physician or patient seeking peace and quiet. One story, rambling house with 3½ acres finest woodland and ravines. Three bedrooms, three baths, vaulted living room, huge stone fireplace, dining room, modern kitchen, screened porch, luxurious closet space, knotty pine interior. Concrete basement, oil furnace, hot water heater, laundry tubs. Suitable year-round. In best repair. Price, $19,500.

For further details address:
Office of Business Manager, North Carolina Medical Journal, Red Springs, N. C.

KNOW YOUR HEART, by Howard Blakeslee, is Pamphlet No. 137 in the series of popular, factual, 20-cent pamphlets issued by the Public Affairs Committee, Inc., a non-profit educational organization at 22 East 38th Street, New York 16, N. Y.

Indications for Protolysate

Low residue, high protein diets, often needed by surgical patients, are more easily formulated when Protolysate is included. The ability of Protolysate to buffer gastric acidity while providing nitrogen nutrition has produced increasing clinical evidence of its value in peptic ulcer. The digestive burden is not increased when Protolysate is used as a dietary supplement.

For literature and professional samples of Protolysate write Mead Johnson & Co., Evansville 21, Indiana.